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A  
T R E A T I S E  
O N  
I N D I G E S T I O N

AND ITS CONSEQUENCES,

CALLED

NERVOUS AND BILIOUS COMPLAINTS ;

WITH

OBSERVATIONS

O N

THE ORGANIC DISEASES IN WHICH THEY  
SOMETIMES TERMINATE.

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BY A. P. W. PHILIP, M.D., F.R.S. L. & E., &c.

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*SEVENTH EDITION.*

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## PREFACE TO THE SEVENTH EDITION.

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THE frequent editions which the following Treatise has undergone have given me many opportunities of endeavouring to render it more useful. It has in the preparation of each edition been carefully revised, and such additions have been made to it as my farther experience has supplied, all of which, I believe, the reader will find, tend to confirm the views originally stated in it, for it is not a repetition in a different form of what has often been said before. The chief motive for its publication was that my experience had suggested a view of the disease of which it treats in several respects different from what had been previously taken; and a practice which I had found more successful than that which had been employed in it: and although there are some who still cling to the former, and as they appear to me erroneous, views of the subject; I believe I am entitled to say that it is now pretty generally admitted by the members of our profession that in the progress of Indigestion the change in the symptoms and nature of the disease which I have pointed out, takes place; and that a corresponding change in the treatment becomes necessary.

It was also a principal object in the publication of this Treatise to point out more fully than had been done, the manner in which the affections of the digestive, influence other organs, and thus lay the foundation of other diseases; a subject which is illustrated by the physiological inquiries in which I have been engaged\*.

\* See the Appendix.

Although this Treatise was addressed to the members of our profession alone, it has from the nature of its subject come pretty generally into the hands of the public at large; and some parts of it have been misunderstood from their not being aware that two technical terms of frequent occurrence in it, pylorus and duodenum, are used, the former indiscriminately with the term lower orifice of the stomach, namely, that orifice by which it is connected with the intestines, the latter with that of first intestine, namely, that intestine which immediately receives the food from the stomach.

In the present and sixth Editions, which are much enlarged, compared with the former Editions of this Treatise, the more protracted cases of Indigestion in particular, both with respect to their symptoms and treatment, are more fully considered. I have endeavoured to trace the causes which render them protracted; to lay down at greater length the plans of treatment which I have found most successful in them, and to ascertain the principles on which their success depends: and a Chapter on Symptomatic Indigestion has been added, which is necessary in order to place in a clear point of view the nature of many, particularly of the more protracted cases.

In enlarging the following Treatise, I have adhered to the plan on which it was originally written, stating merely my own observations and the reflections suggested by them, and that only when they have led to something which has not been stated or sufficiently explained by others.

## PREFACE TO THE FIRST EDITION.

---

My chief objects in the following Treatise have been to give arrangement to the various affections which have been termed Nervous and Bilious; to investigate the nature of the disease on which they depend; to detect the causes which determine them to assume the different forms in which they are presented to us, and to ascertain the appropriate treatment of each of these forms.

In enumerating the symptoms, I have been led to enter more fully than, I believe, has hitherto been done, into the manner in which the sympathy of parts influences the phenomena and treatment of diseases, and thus to endeavour to ascertain some of the laws by which it is regulated.

An attempt has been made to distinguish the symptoms which are the more immediate effects of the causes of the disease, from those which arise from the continuance of the disease itself; and to show, that on a correct discrimination of these two classes of symptoms, the successful treatment, in a great degree, depends.

My attention has been particularly directed to the latter class of symptoms, by which the changes which take place in the progress of the disease are indicated. I have endeavoured to ascertain the nature of these changes, and the manner in which they influence the various functions, and at length, in many instances, destroy the organization of some vital part.

The adaptation of the means of cure to the changing nature of the disease has been constantly kept in view; for similar trains of symptoms, at its different periods, we shall find, require different, and sometimes even opposite, remedies.

I have attempted to point out the influence of regimen, and to determine the rules by which the employment of mercury, which, we have reason to believe, has become too indiscriminate in this disease, should be regulated; and the limits at which its beneficial no longer counterbalance its injurious effects.

In the composition of the following Treatise, recourse has not been had to the works of others. It cannot, therefore, be regarded as an attempt to present to the reader the sum of our knowledge on the subject. I offer it simply as the result of my observations, and the reflections suggested by them, during a space of twenty-five years.

---

## PREFACE TO THE SECOND EDITION.

---

IN revising the following Treatise, the author's only object has been to render it more useful to the practitioner.

As hardly half a year has elapsed since its publication, any considerable enlargement of it is not to be expected; but he hopes that the present edition will be found in several respects improved. Many observations have been added, and an attempt has been made, in several passages, to explain more fully the principles which led to the treatment recommended in it, the author's confidence in which, he is happy to say, has been strengthened since the appearance of the first edition, by communications from several physicians, to some of whom he has not the honour of being personally known.

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PRESIDENT,  
FELLOWS, AND LICENTIATES,  
OF THE  
ROYAL COLLEGE OF PHYSICIANS  
OF LONDON,  
THE FOLLOWING TREATISE  
IS RESPECTFULLY DEDICATED  
BY THE AUTHOR,  
WHO IS DEEPLY IMPRESSED WITH THE ADVANTAGES  
WHICH THE PROFESSION OF MEDICINE HAS  
DERIVED FROM THE INSTITUTIONS,  
AS WELL AS THE SCIENCE,  
OF THAT COLLEGE.

*Cavendish-Square,  
Feb. 1833.*



A  
T R E A T I S E,

§c.

---

IT is a remarkable fact, that there is hardly any disease less understood than that which is most frequently presented to us, and known under the vague denominations of bilious, nervous, and stomach complaints : which seems the more extraordinary, because there is none of greater importance, whether we regard its variety, its consequences, or its connexion with other diseases.

This arises, I believe, from two circumstances. The first relates to the nature of the disease itself. In its early stages, in which other fatal diseases sometimes give us an opportunity of examining the organs chiefly affected, the cause of derangement is in parts too minute for observation : and before its fatal termination, it is so changed, that the inspection of those who fall a sacrifice to it throws little light on its origin. Who, for example, can learn from the appearances in the body of a drunkard, what particular state of the parts concerned caused the dyspeptic symptoms, which preceded the indurated liver and distended abdomen ? The second circumstance to which I allude, relates to the cause of the disease. We know that the digestive power of the stomach depends on a fluid secreted in it, and, consequently, that a deranged state of this fluid, or of the manner in which it is applied to the food, must be the cause of the symptoms of indigestion ; but we can make little practical use of this knowledge, unless we know the immediate causes of the derangement, and the particular manner in which the derangement operates in producing the symptoms of the disease. These are the questions which chiefly interest the physician ; and yet, as far as I know, no attempt has been made to answer them ; and the practice in this disease remains variable and ill defined.

My attention has frequently been arrested by finding, that cases, in which the usual means, in many instances successful, had failed, and indeed often aggravated the symptoms, yielded readily to an opposite plan. Cases relieved by opposite plans of treatment, it is evident, cannot be of the same nature, however similar their causes and symptoms. They are either different diseases, or different stages of a disease, whose nature undergoes some change in its progress.

I have arranged the various cases, of which I am about to treat, under the denomination of Indigestion, because the symptoms of this derangement form a more or less prominent feature in all, and all begin with these symptoms. I prefer this term to *Dyspepsia*, which has been employed by medical writers to express a disease much less varied, and of much less extent than that I am about to treat of. Indigestion, therefore, in the sense in which I shall use this term, is not synonymous with *dyspepsia*, but includes it.

By a disease we mean, not only that collection of symptoms which are present at any one time, but also those which appear in succession, arising from the same source. We shall find Indigestion the most varied of all diseases. Beginning from simple, and apparently unimportant, deviations from health, it gradually becomes so complicated, and often, at length, so undermines every power of the system, that it is difficult to give a view of its symptoms, which shall be at once sufficiently full and distinct. It is an affection of the central part of a most complicated structure, capable of influencing even its remotest parts, and each, through different channels, and in various ways.

I shall divide it into three stages. While this division renders the account of the disease more distinct, it at the same time answers a more important purpose; for we shall find it in these stages varying in its nature as well as its symptoms. In the third stage, indeed, the nature of the disease is so changed, that it has appeared to me the most distinct plan to divide the following Treatise into two parts, reserving for the second part a particular consideration of this stage, and in the first only making such observations on it as its relation to the rest of the disease renders necessary.

## PART I.

### OF THE FIRST AND SECOND STAGES OF INDIGESTION.

I SHALL divide this part of the Treatise into three chapters, on the Symptoms, Causes, and Treatment of the first and second stages of the disease.

#### CHAPTER I.

##### *Of the Symptoms of Indigestion.*

This chapter is divided into four sections. In the first and second, the symptoms of the first and second stages of Indigestion are detailed. In the third sections, some observations are made relating to the third stage; and in the last, relating to the various forms and comparative duration of the different stages.

##### SECTION I.—*Of the Symptoms of the First Stage of Indigestion,*

THE first symptoms of indigestion are either such as immediately arise from the undigested food itself, or from the state of the stomach and bowels which causes the disease, and the irritation of their nerves, occasioned by the undigested food, or their own vitiated secretions.

The symptoms which immediately arise from the undigested food are flatulence, distention of the stomach and bowels, and acid, oily, and putrescent eructations.

From the debility of the stomach and bowels, and irritation of their nerves, a greater variety of symptoms springs. Organs of such importance in the animal economy cannot long be so deranged as to produce vitiated secretions, without, at the same time, giving rise to other deviations from health. The debility of stomach, which prevents a due secretion of healthy gastric fluid, must at length produce some of those other effects which we witness in disorders of this organ.

An emetic, while it remains on the stomach, destroys the appetite, occasions nausea, sometimes pain, and produces, in

consequence of the sympathy which exists between the stomach and every other part of the system, a general state of debility, almost approaching to syncope. The surface is pale, cold, and shrunk, and the action of the heart impaired, the pulse becoming small and feeble. The limbs perhaps tremble, and are always unequal to their usual exertions; and the mind is anxious and subdued. These symptoms, however, disappear as soon as the act of vomiting relieves the stomach from the offending cause.

When we consider that the causes which disorder the powers of the stomach in indigestion are of a more permanent nature, and that the contents which irritate its surface, although often removed, as in the case of the emetic, are soon reproduced, we shall find little difficulty in perceiving the general rationale of the symptoms of this disease. But in order more particularly to ascertain the state of the stomach and bowels in its various stages, it will be necessary to take a closer view of its symptoms, and attempt a more minute investigation of their immediate causes.

THE symptoms which arise immediately from undigested food, exist in various degrees in different cases. In the very commencement of the disease, they are often the only symptoms which occasion much uneasiness; from which it appears, that the functions of the stomach may, for a certain time, be so disordered as to produce a feeble, or otherwise vitiated, secretion, without in any other way very sensibly affecting the functions of the system. People frequently complain of a sense of distention of the stomach after eating, and flatulent and acid eructations, who, notwithstanding, enjoy good general health; and find that even these symptoms may be prevented by taking less food, and that of a more digestible quality; and if they are prudent in this respect, and the constitution is otherwise sound, and not exposed to the effects of indolence, and other causes weakening the nervous system, the stomach will often recover its powers without farther means.

In the majority of cases, however, either from neglect on the part of the patient, or a greater degree of obstinacy in the cause, the above symptoms continue to recur. This never happens, for any great length of time, without the other parts

of the alimentary canal partaking of the disease. Their secretions also begin to suffer some deviation from the healthy state. The mouth is clammy, and the tongue more or less furred, particularly in the morning. The secretions of the intestines, for the most part, are impaired in quantity, and, at the same time, probably, altered in quality. The bowels do not act so readily as usual, and they are occasionally distended and tense, especially some time after eating.

But these symptoms, the patient finds, yield to some mild aperient, which, at the same time, promotes the action of the stomach, and his feelings on the whole differ but little from those of health. He is more apt to be thirsty, his appetite is generally more or less impaired and variable, he complains of his feet being cold; but still his strength, and general appearance, are but little affected, and he seldom thinks it necessary to pay particular attention to symptoms which appear so slight, and for the time yield so readily.

By degrees, however, they recur more frequently, and begin to be attended with some depression of strength, which at first is only occasional. This, in general, is the first thing which seriously calls the patient's attention to the disease. The mind, by degrees, partakes of these returns of languor, and he at length finds it difficult at all times to command his attention, and, upon the whole, that he is not capable of his usual mental efforts. His sleep is disturbed by perplexing dreams, and sometimes by fits of night-mare. In a large proportion of cases, however, the nights are good, and even when the patient is troubled with dreaming and restlessness, he often feels more drowsy than usual.

He now becomes alarmed, and occasionally feels a degree of despondency. Instead of thinking too lightly of his complaint, he regards it in the most serious point of view, and cannot be persuaded that any thing less than some important derangement can produce the anxiety and depression by which his attention becomes wholly engrossed; for none but an attentive physician can know how slight a derangement of the alimentary canal, especially after the habit of disease is formed, is capable of influencing every function of the system.

While the symptoms thus proceed, a change, sooner or later, takes place, which marks an important step in the progress of

the disease. The alvine discharge begins to deviate from the healthy appearance ; it sometimes contains uncombined bile, sometimes it chiefly consists of bile, of which there is occasionally a superabundant secretion ; its colour is sometimes too light, more frequently too dark ; and occasionally, at length, almost black ; at different times it assumes various hues, sometimes inclining to green, sometimes to blue, and sometimes it is mixed with, and now and then almost wholly consists of, undigested bits of food. When there is much straining, it often contains mucus, sometimes in distinct masses, and not unfrequently substances resembling bits of membrane. It frequently separates from the canal with more difficulty than usual, and leaves a feeling of the bowels not having been completely emptied.

We have reason to believe that the above change and variety of colour arise chiefly from the state of the bile, to which the alvine discharge owes its natural tinge, being quite white, when no bile flows into the bowels. It would appear that the properties of the bile are sometimes essentially changed without change of colour ; but this is comparatively so rare, that if the colour of the alvine discharge be natural, we may generally infer that the function of the liver is duly performed.

The disease has hitherto been what, strictly speaking, is called stomach complaints. It is now, from the various appearances of the vitiated bile, and the various symptoms that arise from the irritation which it and the other vitiated secretions occasion in the alimentary canal, what is called bilious and nervous complaints. The former of the two last appellations has also arisen from the bile, in consequence of the inverted action of the duodenum being, occasionally, thrown into the stomach, and there exciting nausea, headach, and bilious vomiting.

Many conceive that the changes of colour in the alvine discharge are often to be ascribed more to circumstances in diet, and changes which the contents of the bowels undergo in their passage through this canal, than to the state of the bile ; and, I have no doubt, these causes operate to a greater or less extent. A long retention generally darkens the colour ; a milk diet produces a discharge of a lighter colour than one consisting chiefly of animal food, and some vegetables and medicines communicate a certain tinge to the discharge. According

to my experience, however, these causes on the whole produce less effect than might be expected, and, with a little attention on the part of the practitioner, will seldom mislead him. It must always be kept in view, that the colour often changes after the discharge has remained for some time out of the body.

The urine also deviates from the healthy state. In its most healthy state, it is perfectly transparent when passed, and remains so after it cools, its colour being more or less deep in proportion to the degree in which its contents are diluted. It is, however, liable to some deviations from this state, under circumstances which can hardly be said to affect the general health.

It appears from some experiments which I made many years ago, for the purpose of ascertaining the effects of various circumstances in diet, &c., on the state of the urine, an account of which the College of Physicians of London did me the honour to publish in the last volume of their *Transactions*, that when acid greatly prevails in the stomach and bowels, or the skin becomes more inactive than usual, so that it does not freely throw off the acid, which it appears from these experiments always passes by this organ, a red deposition, which consists of lithic acid, takes place from the urine after it has stood for some time, this fluid still remaining clear; and on the other hand, that when the skin has been unusually excited, or an alkalescent state of the stomach and bowels prevails, it becomes turbid, and deposits a whitish and often pinky sediment, which seems chiefly to consist of the phosphates of the urine, on the nature of which the experiments of Dr. Wollaston have thrown so much light, and the lithate of ammonia\*.

Both these states are more apt to appear in indigestion than in health; and the urine in this disease is sometimes covered with a thin oily-looking film, which, according to Dr. Prout's experiments, consists of minute crystals of the triple phosphate. Sometimes also it is limpid, and passed in unusually large quantities, more frequently scanty and too highly coloured. It is then most apt, as we should *à priori* expect, to deposit the above sediments, unless a considerable degree of fever pre-

\* An Inquiry into the Nature and Treatment of Gravel, &c., by William Prout, M.D., F.R.S.

vail, when it often either deposits nothing, or a little of the red sediment.

A remarkable sympathy between the state of the kidneys and intestines is frequently observed in indigestion, the urine remaining scanty and high-coloured, when the bowels are constipated; and flowing freely, and of a paler colour, as soon as a free discharge from them has been obtained. Even in those dropsical affections which sometimes supervene on the more severe forms of this disease, it is not uncommon for all diuretics to fail, when the bowels are constipated, and for the operation of purgatives alone to be followed by a free discharge from the kidneys.

The copious flow of urine which sometimes attends indigestion seems frequently to arise from a failure in the action of the skin, as appears from some of the experiments relating to the effects of diet above referred to. The kidneys and skin separate the same fluid from the blood, and a failure of secretion from the latter is often compensated by an increase of that from the former, if they have not by sympathy partaken too much of the state of the skin. Thus in dyspeptics an unusual application of cold to the surface, when the powers of the system are not able so to re-act as to support the due action of the skin under it, frequently occasions an increased flow of urine.

The same cause often occasions a greater and more than usually liquid discharge from the bowels; but it particularly demands attention, that when the skin has, from the continuance of the disease, become uniformly languid, the increase is often in the solid, as well as liquid, contents of the bowels. On the same principle, the quantity which passes from the bowels of delicate children, when the skin has become dry and shrivelled, is frequently astonishing, and that even when little nourishment is received, as if not only what ought to have passed by the skin, but a great deal of what had been inhaled by this organ were deposited in a solid form in the alimentary canal. Some facts would lead us to suppose that, in such a state of the skin, the inhalation by it is often very great. I have seen several gallons of water drawn from a child ten or twelve years old, labouring under extensive abdominal disease, and apparently re-collected in eight or ten days, although but little fluid had been taken.

What is here said is well illustrated by an opposite state of the system. In very great eaters, the alvine discharge is often no greater than in other people, but the secretion by the skin much more free. Even in a remarkable case of this kind, an account of which appeared in the medical journals of the day (1797), in which an individual could eat daily twelve or fifteen pounds of raw meat, and would have starved if confined to the allowance of two or three ordinary men, the alvine discharge was little, if at all, greater than usual, yet he continued thin, and the superfluous quantity of nutriment ran off by profuse night-sweats.

The sensible change in the appearance of the alvine secretions in indigestion, is generally attended with some change in the other symptoms. The stomach is more apt to be oppressed after eating, the patient often remarking that he feels as if there were not room for what he had taken. The bowels are more frequently variable, diarrhœa often arising without any evident cause, followed by fits of constipation. These, the patient finds, cannot now be removed by the simple medicines which at first succeeded; larger doses or more active medicines are necessary, and their effect corresponds with the previous state of the bowels. The discharge is generally unsatisfactory, something seeming to be retained. It is very often watery, sometimes rejected as it were by starts; or frequent, small, semifluid, teasing, mixed with mucus, and sometimes streaked with blood, and, after it has frequently recurred, often chiefly consists of mucus and a little blood, the passage of which is attended with pain and bearing down, and followed by a constant desire of further evacuation. The patient takes more medicine, with the hopes of a freer effect, but he thus often increases the straining more than the discharge.

After this state of irritation has continued to recur for a great length of time, a degree of permanent spasmodic stricture sometimes appears to take place in the rectum. This I have known happen to such a degree as to give a tape-like appearance to the alvine discharge for many months without intermission, and suggest the idea of organic stricture, till an examination of the part proved its real nature. A more temporary contraction of the rectum, occasionally giving this appearance to the discharge, is not uncommon.

In the mean time the patient is harassed with a variety of other symptoms, arising from the irritation of the morbid contents of the alimentary canal ; increasing languor, pains of the stomach, more frequently of the bowels, and particularly of the lower part of the bowels, sometimes continued, generally of the griping kind, a sense of heat, or, as the patient often calls it, burning, referred to the stomach, and now and then extending to the bowels, which sometimes proves the most obstinate and distressing symptom of the disease, or of weight in the right hypochondrium or lower part of the abdomen, with unusual distention of the former, sometimes disappearing in a day or two, particularly after freer evacuations, and returning again, at other times more stationary ; a more foul and clammy tongue than at earlier periods, nausea, more rarely vomiting, a depression of strength, which sometimes, particularly after the unsatisfactory operation of cathartics, almost amounts to syncope, and a despondency that is hardly equalled in any other disease.

With these symptoms, which are different in different constitutions, those which arise from sympathy between the stomach and other parts of the system, gradually show themselves. They also are different in different cases, pain and other complaints of the head, affections of the sight, the hearing, smell, or taste. More or less habitual inflammation, and even ulceration of the throat are by no means uncommon, and the voice and articulation are sometimes variously affected. Spasms of the trunk or limbs, numbness, and even temporary loss of power in the latter are not unfrequent ; and feelings of endless variety are described as sometimes affecting one part of the body and sometimes another.

By a constant recurrence of such attacks without being uniformly ill, for the rapidity with which the patient rallies is often as great as that with which he is subdued, he is gradually rendered unfit for the active duties of life. This preys on his mind, increasing the despondency which makes part of his disease, and which in its turn, by further debilitating the digestive organs, aggravates all the symptoms.

These organs being no longer in a proper state to prepare due nutriment, the body becomes emaciated, and more permanently feeble, the strength by degrees rallying less readily

and less perfectly after the frequent returns; and what was at first only a temporary depression from a debilitating cause affecting the nerves of the alimentary canal, is gradually changed into real debility, the countenance, which is almost always a sure index of what is passing internally, becoming pale and haggard.

It is of great importance in judging of the state of this disease, to distinguish between debility and what may be called depression of strength. In the latter the action of the vital powers is impeded, in the former their vigour is impaired. The one may supervene in a moment, and may be as instantly relieved; the other, unless the cause be very powerful, comes on more slowly, and is in all cases slowly removed. We have an instance of depression of strength in the effects of an offending cause in the stomach and bowels, which cease as soon as the cause ceases to operate: of debility in the effects of repeated irritation of these organs which continue after the cause of irritation no longer exists. Thus the debility which appears suddenly at the commencement as well as at other periods of indigestion, is of trifling importance, compared with that more permanent debility which supervenes gradually, the symptoms of which are often slight compared with those of temporary depression of strength, but which is always more difficult to cure. The one is chiefly important as it indicates what is passing internally: the other proves that the powers of the constitution are yielding to the disease. Either mistaken for the other leads to serious errors in practice.

Even from an early period of indigestion, the patient often feels some uneasiness on lying on the left side; more rarely this is the case with respect to the right side. At later periods, lying on either side becomes uncomfortable, and, in the advanced stages, the only easy position is on the back, with the shoulders a little raised, and, for the most part, inclined to the right side.

Such is the general course of Indigestion. Those who are acquainted with the laws of sympathy, which in so striking a manner modify the phenomena of disease, will expect, that in the parts which most sympathize with the stomach and bowels, its symptoms will be found most varied. Thus it is that the tongue and other parts of the mouth are variously affected from

the commencement. Their secretions often become more and more thick and clammy, the former being covered with a white or brownish mucus, which also more or less adheres to, and irritates the fauces ; sometimes all these parts are parched and stiff, at other times the saliva is morbidly thin and copious, the tongue being cleaner, but often of a whitish and sodden appearance. In protracted cases, when the symptoms have been rather obstinate than severe, and considerable debility has come on, this symptom is sometimes very troublesome, the saliva frequently running from the mouth. In the advanced stages of the more severe cases, a viscid frothy secretion from the fauces, while the mouth in general is drier than usual, often forms a very prominent feature of the disease. The patient is constantly hawking up this matter, particularly after eating, and will tell you that all his food turns to phlegm. This discharge is sometimes so great and harassing as to prove the most distressing symptom, and seems not a little to add to the debility. In some cases the tongue becomes clean, shining, and morbidly red and smooth, and at length affected with aphthæ. This seldom happens except when a considerable degree of fever has supervened, which is not uncommon at advanced periods.

The skin, in protracted cases, is often dry, shrivelled, and sometimes, at length, almost scaly ; the nails become dry and brittle, and often curved ; the hair is parched, and inclined to stand on end, and the whole surface cold. The patient is constantly hanging over the fire, and sometimes even experiences frequent fits of chilliness approaching to shivering ; he bears all extremes of temperature ill, being as much oppressed by a very high temperature as he is chilled by a low one ; wounds heal less readily than usual, and the skin is not unfrequently affected with a troublesome itching, which often shifts its seat, or with nettle-rash, herpes, and other species of eruptions ; and even ulceration sometimes supervenes without any evident cause.

Besides the more transitory symptoms in the head, which have been mentioned, there are often marks of an habitual undue determination of blood to the brain, producing turgescence or languid inflammation of the eyelids, a ringing or other noise in the ears, and occasionally throbbing of the temples. Some

are oppressed with drowsiness, sometimes almost approaching to stupor, or fatigued by a restless and disturbed sleep; others complain of pain more or less severe, sometimes in the back or one side of the head, more frequently in the forehead; and some are subject to giddiness, and even to sudden fits of insensibility.

The thoracic viscera are often particularly affected, occasional, and not unfrequently, more or less permanent, dyspnoea supervenes: and the patient is sometimes harassed by a dry and irritating cough, or with fits of palpitation. When expectoration attends the cough, it is generally difficult, but brings considerable temporary relief. It deserves notice, that in this stage of the disease, he more frequently complains of pain in the left than in the right side; but the seat of the pain is very various, not unfrequently, it is chiefly in the back, about the shoulders, sometimes attended with itching, and in the limbs, more frequently in the legs than the arms. Irregularity of pulse and syncope are not unusual symptoms. The former I have repeatedly known continue for years, even attended with the more characteristic symptoms of *angina pectoris*, without organic affection of the heart having supervened, although under such circumstances it is always to be feared. It is not uncommon for the muscles of the chest to become painful on motion, and even to the touch. The abdominal muscles also are sometimes affected in the same way. This affection is apt to be worst at night, so that the patient turns himself in bed with difficulty and pain.

#### SECTION II.—*Of the Symptoms of the Second Stage of Indigestion.*

At various periods of the disease, for the most part after repeated derangement of the hepatic function, comes on a permanent tenderness on pressure, sometimes but slight, of the soft parts close to the edge of the cartilages of the false ribs on the right side, after they have turned upwards to be joined to the breast bone. This spot is often very circumscribed, and always lies about half-way between the pit of the stomach and the place at which the lowest of the cartilages begins to ascend; and the cartilage itself near the tender part often becomes very tender, not unfrequently, indeed, much more so than the soft

parts. The patient in general is not aware of this tenderness till it is pointed out by the physician.

This symptom never exists long, and to any considerable degree, without the pulse becoming tight \*, and it often at the same time becomes rather more frequent than in health. There is no other symptom of the disease before us to which I am so anxious to call the reader's attention, as to what I have here termed a tight pulse, because on it much of the proper treatment seems to depend. It sometimes happens, especially when the tenderness in the epigastrium is considerable, that the pulse becomes such as would on all occasions obtain the name of hard ; but more frequently the hardness is only to be distinctly perceived by examining the pulse in a particular way.

Those who have been much in the habit of examining the different states of the pulse must be aware, that its hardness, or what I have called tightness, is most perceptible when a slight degree of pressure is employed. A certain degree, by greatly compressing the vessel, will give some feeling of softness to the hardest pulse, and a slight degree of hardness is not perceptible with the pressure generally employed in feeling the pulse. If the pressure be gradually lessened till it comes to nothing, it often happens that a tightness of pulse is felt before the pulse wholly vanishes under the finger, when none can be perceived in the usual way of feeling it.

This is in no degree the case in the pulse of a healthy person, nor even of those labouring under the first stage of the disease we are considering. But when the tenderness of the epigastrium is at all a prominent feature, it may always be perceived ; that is, there is then a certain degree of pressure, sometimes very slight, under which the pulse gives a decidedly wiry sensation to the finger, the degree of pressure under which the tightness may be perceived denoting its degree. It is most sensible immediately after the patient has been using exercise.

I consider the occurrence of the tenderness and tight pulse as denoting the second stage of the disease, because from the

\* I prefer the term tight to hard, because, for reasons explained in my Inquiry into the Laws of the Vital Functions, I believe this state of the pulse arises from the vessels embracing the blood with greater force than in health.

time of their appearance, at whatever period this happens, we shall find its nature, and consequently the plan of treatment suited to it, changed.

These symptoms are generally accompanied with others indicating some degree of feverishness. The chilliness of which the patient has long complained, is now, independently of any change of temperature in the surrounding medium, sometimes interrupted by languid and oppressive fits of heat; and the hands and feet, instead of being uniformly cold, as in the earlier stages, often burn, particularly during the first part of the night, while at other times they are more obstinately cold. The thirst also often increases, and sometimes there is a tendency to partial sweats in the morning, especially if the patient lie longer than usual; and the change we are considering is for the most part attended with an increase in some of the other symptoms of the first stage.

When the tenderness and hard pulse are considerable, there is generally, more or less, an inability of exercise, except of the passive kind, much active exercise producing an insupportable languor; but slighter degrees of the above symptoms are generally unattended by this inability.

The tenderness, after it has lasted for some time, begins to extend downwards along the edge of the cartilages, and to be attended with a degree of fulness in the tender part, till at length there is some fulness, and often tenderness, throughout a great part of the right side of the abdomen, which feels firmer than the left; but the tenderness is seldom so great as in the part above described. Sometimes the pressure, both there and as far as the fulness extends, rather produces a sense of oppression affecting the breathing than pain. Sometimes, particularly near the stomach, it occasions pain passing through the body towards the back, sometimes quite to the back, at other times, pain or a sense of oppression under the breast-bone, and, in some cases, a pain extending to the left side.

There is often, we have seen, a degree of fulness in the right side at earlier periods, which is then more transitory, being generally relieved and sometimes removed by purgatives, and not unfrequently spontaneously disappearing and returning again.

Such is the regular course of what I have called the first and

second stages of indigestion ; but there is a class of symptoms, or rather a modification of certain symptoms, which, although not forming an essential, constitutes, when it does appear, the most important part of the disease. We have seen, that even from the commencement, distant parts of the system, particularly those which sympathize most with the stomach, suffer. When any part has suffered more frequently than the rest, and its powers consequently are more debilitated, its affections, as the second stage proceeds, assume in some degree a different and more prominent character. Thus headach, affections of the chest, of the lower bowels, &c., often at length become the chief disease.

It particularly deserves attention that the secondary affections undergo the same change with the disease from which they spring. In the first stage they are merely nervous affections, disappearing as soon as the cause which produced them ceases to operate. In the second stage they assume an inflammatory character, become more and more of a permanent nature, and in the same proportion, more independent of the original disease, till at length they cannot be removed without an appropriate mode of treatment directed to the part secondarily affected. This circumstance renders a particular consideration of them necessary in laying down the means of cure : it will therefore tax the reader's memory less, and save repetition, to defer any further account of them till we come to this part of the subject. I shall then, also, for the same reasons, lay before him such observations relating to the nature of these affections as exclusively apply to them. After this explanation, I hope I shall not be accused of a neglect of order in what I shall say on this part of the subject.

In reviewing the symptoms of the disease which forms the subject of this Treatise, it may be observed that all the affections which are called, and strictly speaking are, nervous, are apt at length to be attended with febrile symptoms ; injury ensuing, if, at the period when this change takes place, a corresponding change is not made in the means of cure. Many facts point out, that long continued nervous irritation terminates in an inflammatory state of the organ affected. Even an affection which, in the first instance, is wholly sympathetic, arising from irritation applied to a distant part, will, if severe

or long continued, terminate in inflammation of the organ sympathetically affected.

In the 43d, 44th, and 45th Sections of *Morgagni's* 21st Epistle, the reader will find the pleuritis verminosa treated of at some length; he mentions one case in which all the symptoms of pleurisy were well marked, that terminated favourably by bloody vomiting which brought up a worm. We might in this instance attribute the relief obtained rather to the loss of blood than the expulsion of the worm, but he refers to a paper of Pedratto on the pleuritis verminosa, where the relief obtained by the expulsion of worms from the stomach and intestines, particularly from the former, is unequivocally proved.

It there appears that all who vomited the worms, or passed them by the bowels, recovered, while those who did not, died. All the common means of treatment in inflammation of the lungs failed; medicines which destroyed the worms alone were successful. While their expulsion immediately removed the disease, it is impossible for us to believe that real inflammation of the lungs had existed; yet in those in whom the disease had been allowed to take its course, the same appearances were found in the lungs as in other forms of inflammation.

We often see the same principle strikingly illustrated in the diseases of children. We find it obtaining indeed in every instance. When affections of the liver produce pain in the shoulder, there is no disease in this part. The pain is merely sympathetic. If we press or rub the shoulder, the patient feels no more uneasiness from it than he would in the other shoulder; but after the pain has continued for a considerable time, the shoulder itself often becomes affected; he cannot then bear to have it pressed, and sometimes cannot lie upon it.

When inflammation spreads from the muscles of the side to the lungs, it does not follow the course of their membranes, reaching the lungs by the fold by which they are reflected over them. It passes at once from the membrane of the ribs to that of the lungs, between which there is no direct communication, for this often happens previously to any adhesion having taken place. Why is inflammation of the bowels as apt to spread to the contiguous parts, with which they have no immediate connexion, as to those which are in continuation with the diseased part? Why does loss of blood, by the application of leeches to

the skin over an inflamed organ, often give more relief than the loss of many times as much blood from a distant part? It is needless to multiply instances; whoever observes with attention the phenomena of disease will find them numberless. I have just had occasion to mention a striking one, in which the tenderness on pressure of the internal parts is communicated to the neighbouring cartilage.

These facts teach an important lesson in the prevention of disease, that the first beginnings of many sympathetic affections, however trivial, should be watched with care. The headach frequently occurring from disordered stomach, may at length become a disease of the head itself; and there is no organ, we have reason to believe, in which disease may not arise in the same way. They teach a lesson of equal importance in the treatment of diseases, the necessity of being minutely acquainted with the history of the case, in order to ascertain, whether sympathy with other parts had contributed to produce disease in those now most prominently affected; for if this has been the case, and the affection of the former still continues, we shall attempt in vain to restore health by means directed alone to the latter.

It will appear, I think, from what I am about to say, that it is of the last importance, in the treatment of indigestion, to observe the period at which the disease ceases to be a case of mere nervous irritation, producing disordered secretion; and begins to affect the sanguiferous, as well as the nervous, system; which in many cases happens long before organic disease has taken place, but which, if not counteracted, is frequently its precursor.

Indigestion thus naturally divides itself into three stages: In the first appear the various symptoms above enumerated, immediately arising from the undigested food, from the state of the stomach and bowels, which is the cause of the disease, and the additional irritation to which these cavities are subjected by the undigested food and vitiated secretions; the second is characterized by tenderness, or other uneasiness on pressure in the parts above pointed out, and a degree of tightness in the pulse, often accompanied by other febrile symptoms; and the third, by the symptoms of organic disease.

SECTION III.—*Some Observations relating to the Third Stage of Indigestion.*

It appears, from what has been said, that in the local affections of the second stage of indigestion, the sanguiferous as well as nervous power of the part affected is involved in the disease. This state of general derangement of the powers of life, if it exist in any considerable degree, cannot long continue without change of structure. The symptoms indicative of such derangement, therefore, when severe, and affecting organs liable to change of structure, are the immediate forerunners of organic disease. If they cannot be arrested, they usher in the last stage of indigestion. It is a curious fact, and one of the greatest importance in the treatment, that in Indigestion the organic affection rarely takes place in the original seat of the disease, but in other organs with which the stomach sympathizes, the liver, pancreas, spleen, mesenteric glands, lower bowels, heart, lungs, brain, &c.

Thus, when the body is examined after death, the patient is said to have died of disease of some of these organs, and there is nothing in their appearance to distinguish such affections from diseases which originate in them. It is only by a careful attention to the history of the particular case, and to the laws of the animal economy, that we are enabled to distinguish the sympathetic from the primary disease.

With respect to those cases in which the lungs become diseased, I attempted some years ago, in a paper which the Medico-chirurgical Society did me the honour to publish in the seventh volume of their *Transactions*, to point out the means of distinguishing them from primary disease of the lungs, and the peculiar treatment which the sympathetic disease requires to prevent its proving equally fatal. In the present publication, I am about to enter into the subject more fully, and endeavour, as far as a long-continued and anxious attention to the phenomena of the cases in question, and the laws of the animal economy will enable me, to trace the nature and the consequences of that affection of the centre of the system, for so the stomach may justly be called, which, if neglected, produces a general tendency to disease, that often, at length, if I may so speak, fixing on some vital part, destroys its organization.

It is a curious circumstance in the progress of the disease we are considering, and particularly demands attention, that when it fixes decidedly on one organ, the others which have been affected, are, to a certain degree, and sometimes wholly, relieved. The establishment of the secondary affections generally relieves the dyspeptic symptoms; and even a secondary disease may be relieved by another supervening on it.

Thus, it is not uncommon in indigestion for the liver to suffer in such a manner, that it shall become enlarged and tender on pressure; and when the disease is destroying the texture of the lungs, having spread from the liver to them, for the former to recover, or nearly recover, its healthy state. Sympathetic disease, when established, that is, when the vessels as well as nerves of the part have become affected, seems to act on that which excites it in the same way, though much more effectually, in which artificial drains are found to do; while the sympathetic affection which precedes the establishment of actual disease, tends to increase the original derangement. Thus an extensive external affection, as I have witnessed, occurring in such cases, will often save the vital organ, even after the disease has made considerable progress in it.

Why the spontaneous occurrence of external disease in these cases produces an effect which we can so feebly imitate by exciting such a disease, we can no more explain than why a spontaneous sweat carries off fever, while one produced by art, and even by means which themselves allay fever, often brings little or but partial relief; or, why a spontaneous fit of shivering is often followed by a hot fit and perspiration which puts a period to the fever, while a shivering produced by art would only increase it.

To enter fully on what I have called the third stage of Indigestion, that in which it has produced organic affections, would be foreign to my purpose, and would lead to a consideration of a large proportion of all the most serious diseases to which we are subject; for there are perhaps few organic diseases which may not arise from an affection of the digestive organs, and organic diseases not only vary according to their degrees and the organ they affect, but according to the consequences resulting from them, abscess, atrophy, dropsy, &c.

I shall, in the second part, treat of this stage of the disease at such length as the nature of the present Treatise admits of. My reasons for laying before the reader the causes and treatment of the first and second stages, the symptoms of which have been detailed, before I enter on a more particular consideration of the last stage, I have already stated.

SECTION IV.—*Of the various Forms and Comparative Duration of the different Stages of Indigestion.*

THE relative duration of the different stages, as well as the severity and nature of their symptoms, is very various in different cases. In some the first stage is very slowly, even when the occasional causes of the disease have been long and repeatedly applied, changed into the second. Thus we see men of the most irregular habits, and others whose habits are good, but whose digestive organs are naturally weak, for many years labouring under the symptoms of the first stage of indigestion, without the disease, if I may be allowed the expression, fixing on them. The former are greatly indebted to a natural vigour of constitution, and in the latter, the stomach alone is weak. In the former, particularly when the above-mentioned symptoms have been severe, when at length any considerable degree of inflammatory tendency supervenes, change of structure often very quickly ensues; the organs, from long-continued irritation, being, as it were, prepared for the change.

In others, on the contrary, particularly those of a more feeble constitution, the second stage soon shows itself. Before the symptoms of the first stage have long attracted notice, tenderness in the epigastrium supervenes, and the pulse becomes contracted. In such cases, the second is generally the protracted stage of the disease, and the patient often continues to be much harassed, and occasionally seriously ill, for a long time before organic disease is established.

After this has taken place, the duration of the disease, in different cases, is still very various, the change proceeding more or less rapidly according to the strength of the constitution, and other causes, some of which seem involved in great obscurity. But it may in general be observed, that the longer and to the greater degree the causes have been applied previous to the occurrence of organic disease, the more rapid is its progress.

The proportional prevalence of the different symptoms of indigestion is as various as the duration of its stages.

In the first stage, pains and other affections of the head in some, in others, fits of palpitation, cough and dyspnœa, or distention and pains of the stomach, or flatulence and irregularity of the bowels, are the most troublesome symptoms. The symptoms of the second stage, in like manner, which are both more varied and more strongly marked than those of the first stage, in some, are chiefly confined to the abdomen; in others, affect the other cavities, and the different symptoms are variously modified in different cases.

Thus indigestion presents itself in a thousand forms, which in its progress assume more decided characters; and no cases can differ more from each other than those which form the last stage of this disease, being affections of organs which differ equally in their nature and their functions; and it tends still further to perplex the symptoms, that in some cases the disease proceeds in more than one organ at the same time, the affection of the one not arresting that of the other, as we have seen often happens.

In every stage of the disease, indeed, there is endless variety, and the more nearly it approaches to its fatal termination, the more its different cases assume the appearance of diseases which have nothing in common.

With regard to the circumstances which dispose the sympathetic disease to affect one part in preference to another, we have reason to believe that this is chiefly determined by different parts in different individuals being more liable to disease than others, and therefore feeling more the cause of irritation which affects the whole system. Thus in children, who are disposed to inflammation and subsequent effusion in the ventricles of the brain, indigestion often terminates in what is called water of the head. From about fifteen to thirty-five years of age, the disposition to affections of the lungs is greatest, and it often produces consumption. At a more advanced period, a tendency to disease of the lower bowels prevails, and in old age to affections of the heart and head; the latter, however, of a different nature from those to which children are subject; and we still observe the tendency of indigestion to produce the disease to which the system is disposed, whatever be its seat.

These observations seem particularly applicable to the inflammation and consequent organic affection of the feet in gout. When a tendency to this disease exists, it may be induced by any cause that produces, and for a certain time keeps up, indigestion. In some the disposition to gout is so great, that it appears without being preceded by symptoms of derangement in the first passages; but in the majority this is not the case, and the tendency to these symptoms seems to constitute a considerable part of the hereditary disposition to gout.

The regular forms of gout not affecting a vital part, tend less to derange the system in general, and give more relief to the primary disease than most of the other symptomatic affections which have been enumerated, the patient often remaining well for some time after them; and the more cautious he is in preserving the vigour of the digestive organs, the longer interval he enjoys. Hence appears the danger which attends interrupting the regular fits of gout, the sympathetic disease being prevented from taking the course which the disposition to affection of the extremities gives it, seizes on the part, generally an internal one, which next to these is most liable to disease, and what is called atonic or misplaced gout is produced; and, on the other hand, if any thing so affects any of the vital parts during a fit of gout as to render it considerably the weakest part, the sympathetic disease sometimes leaves the joints, and seizes on that part, occasioning what is called retrocedent gout. It is evident that the risk of both these accidents will be greatest, where the powers of the system are most impaired.

The connexion of indigestion and urinary gravel particularly deserves attention, as it differs from the connexion of the former with the preceding diseases. It is not by sympathy alone that indigestion appears to produce this disease. I have already had occasion to make some observations on the states of the urine in indigestion. In most cases, we have seen, there is a considerable production of acid in the first passages. This acid, as appears from the experiments above referred to, enters the mass of blood, and is thrown out of the system by the skin and kidneys. As all other acids occasion a precipitation of lithic acid from the urine, when the action of the skin

is impaired, the acid we are speaking of often passes in such quantity by the kidneys as to cause a deposition of lithic acid, before the urine leaves these organs, which there frequently concretes into small masses occasioning fits of gravel.

We have seen that a precipitation of lithic acid, after the urine has stood for some time, is a frequent symptom of indigestion. The gravel which often attends this disease is only a greater degree of this symptom, for it appears, from the observations of the best writers on calculous diseases, that the calculi formed in the kidney are almost always concretions of lithic acid\*. Thus it seems to be, that in old age, gout and gravel often alternate, as it is in the intervals of gout that indigestion chiefly prevails, the affection of the joints relieving the stomach during its continuance. The degree and duration of this relief, after the fit, becomes less in proportion as the constitution has been enfeebled by repeated attacks.

## CHAPTER II.

### *Of the Causes of Indigestion.*

THE causes of a disease are divided into immediate and remote, the changes in the body which more or less directly excite the symptoms, and the causes which produce these changes.

As it is impossible to understand the operation of the causes of indigestion, without a knowledge of the digestive process, our attention must, in the first instance, be directed to this subject.

#### SECTION I.—*Of the Process of Digestion.*

It has been ascertained by the experiments of Spallanzani and others, that the stomach secretes a fluid capable, even out of the body, of converting the food into such a mass as that into which it is changed in the stomach, immediately before it is sent into the first intestine; a fact which leaves no room to doubt that it is by the agency of this fluid that the food undergoes the change which is effected on it in the stomach: and it appears from the observations of Mr. Hunter, that such is the power of the gastric fluid, that it often corrodes the sto-

\* See the references in the paper above-mentioned, in the last volume of the *Transactions of the College of Physicians*.

mach itself when deprived of the vital power by which it is enabled to resist its action. When to these facts we add, that by means of the muscular power of the stomach, the food, when duly prepared by the action of the gastric juice, is propelled into the duodenum, we state the sum of our knowledge on this subject. These facts, however, are far from affording an explanation of the process which takes place in the stomach. It does not appear from the observations of any of the authors here referred to, by what means the fluid which is secreted by it is uniformly applied to the food, nor upon what principle the food which is prepared for the duodenum is separated from the rest.

Mr. Hunter found that even when part of the stomach itself had been dissolved by the gastric juice, the food last taken remained wholly unchanged. This fact alone is sufficient to militate against the idea assumed by some, that by the muscular power of the stomach its contents are so moved as to be continually in the act of being mixed together, and with the gastric juice, by which their uniform solution is effected. According to this view of the subject also, it would be difficult to account for the gradual discharge of the contents of the stomach into the first intestine. This intestine must either for a long time cease to receive any food from the stomach after every addition made to the contents of the latter, or receive food in different stages of solution, an imperfection in a natural process which is in opposition to every thing we know of the animal economy.

My attention was particularly called to the subject by finding from many trials, that when the eighth pair of nerves is divided in the neck of a rabbit, and one portion of each nerve folded back\*, immediately after the animal has taken a full meal, after a fast of whatever continuance, none but undigested food is found in its stomach, provided it has been allowed to live for a certain number of hours after the operation.

\* It has been found by repeated experiments, that if neither of the divided ends be displaced, some nervous influence still passes by the divided nerve, and that, although the divided ends be separated by a space of even a quarter of an inch. See the *Journal of the Royal Institution*, No. 23, page 17, *et seq.*

Now if, without the division of these nerves, the rabbit be killed at any period after eating, however long, some food is always found in its stomach, reduced apparently to the state in which it is sent into the intestine, and from the continued secretion of the fluids of the stomach, if the fast has continued for many hours, mixed with a greater than usual proportion of them. It would seem indeed that the stomach of this animal is not able so to contract as to expel the last part of its contents.

When the foregoing observations are compared with this experiment, it will appear, either that the food, last received into the stomach, is never mixed with that already there, and which has more or less undergone the action of the gastric fluid, or if they be mixed together, that the stomach has the power of again separating them, retaining the one and propelling the other into the intestine. These facts induced me to make some experiments on a large scale, for the purpose of ascertaining with greater accuracy the process which takes place in the stomach, without which it is impossible to understand the nature of the symptoms which arise from its defects.

With this view I examined the stomachs of about a hundred and thirty rabbits immediately after they had been killed in the usual way, which is by a blow on the back part of the head, at various periods of digestion. The following were the results\*.

The first thing that strikes the eye on examining the stomachs of rabbits which have lately eaten is, that the new is never mixed with the old food. The former is always found in the centre, surrounded on all sides by the old food, except that on the upper part between the new food and the smaller curvature of the stomach there is sometimes little or no old food. If, as we ascertained by more than twenty trials, the old and the new food be of different kinds, and the animal be killed before a great length of time has elapsed after taking

\* *Inquiry into the Laws of the Vital Functions.* It is hoped that the reader will excuse the frequent references to this Treatise in this and the last Section of this Chapter, because it is by facts, which appear to be ascertained in it, that I shall attempt some parts of the pathology of Indigestion.

the latter, the line of separation is perfectly evident, so that all the old may be removed without disturbing the new food. To ascertain this point, we fed rabbits on oats, and after making them fast for sixteen or seventeen hours, allowed them to eat as much cabbage as they chose, and killed them at different periods, from one to eight hours after they had eaten it.

On opening the stomachs of rabbits three or four weeks old, who both sucked and ate green food, we always found the curdled milk unmixed with the green food. Before the stomach was opened we could, from its transparency, see where the green food and where the milk lay.

If the old and new food be of the same kind, and the animal be allowed to live for a considerable time after taking the latter, the gastric fluid passing from the old to the new food, and changing, as it pervades it, renders the line of separation indistinct. So that, on a cursory view, we should suppose the old and new food mixed together; but towards the small curvature of the stomach, and still more towards the centre of the new food, we find it, unless it has been very long in the stomach, undisturbed and comparatively fresh. All around, the nearer the food lies to the surface of the stomach, the more it is digested. This is true even with regard to the food in the small curvature, compared with that nearer the centre, and the food which touches the surface of the stomach is more digested than any other found in the same part of the stomach; but, unless the animal has not eaten for a great length of time, the food in contact with the surface of the stomach is in very different stages of digestion in different parts of this organ. It is least digested in the small curvature, more in the large end, and still more in the middle of the great curvature.

The foregoing observations apply to the large end of the stomach; the food in the pyloric portion is always found in a state very different from that just described. It is more equally digested, the central parts differing less from those which lie near the surface. It is evident, however, that all the change effected in the stomach is not completed when the food enters this portion of it, because we find it the more digested the nearer it approaches to the pylorus, where, being ready to pass into the intestine, it has undergone all that part of digestion which is performed in the stomach.

It appears, that in proportion as the food is digested, it is moved along the great curvature, where the change in it is rendered more perfect to the pyloric portion. Thus the layer of food lying next the surface of the stomach is first digested, and in proportion as this undergoes the proper change, and is moved on by the muscular action of the stomach, that next in turn succeeds, to undergo the same change.

As the gastric fluid, to a certain extent, pervades the contents of the stomach, though apparently in no other way than by simple juxtaposition, for the arrangement of the food, above described, we never found disturbed; the change in each portion, which in its turn comes in contact with the stomach, is far advanced before it is in actual contact with it, and, consequently, is soon after this in a proper state to be moved on towards the intestine.

Thus a continual motion is going on, that part of the food which lies next the surface of the stomach passing towards the pylorus, and the more central parts approaching the surface; whether food is ever so digested in the small curvature, as to be sent to the pyloric portion without having traversed the large curvature, is comparatively of little importance. When rabbits have fasted sixteen or eighteen hours, the whole food found in the cardiac portion, which is in small quantity compared to what is found in it after a fast of short duration, seems to be nearly in the same state with that next the surface of the large curvature, the gastric fluid having pervaded and acted upon the whole, and is consequently, as far as we can judge, prepared to be sent to the intestine.

It was in the great end of the stomach, where digestion, we shall find, goes on most rapidly, that Mr. Hunter found the stomach itself dissolved, and by the most satisfactory arguments showed that this is the effect of the gastric fluid after death. His observations on this subject confirm the foregoing view of digestion, and show that the same process, observed in the stomach of the rabbit, takes place in the human stomach; for he found part of the stomach dissolved, while the recent food it contained remained wholly undigested, in the case of a man who happened to have been killed immediately after a full meal.

This I have often observed in rabbits when they have been

killed immediately after eating, and allowed to lie undisturbed for some time. On opening the abdomen, we have found the great end of the stomach soft, eaten through, sometimes altogether consumed, the food being only covered by the membrane which covers the stomach, or lying quite bare for the space of an inch and a half in diameter, and part of the contiguous intestines in the last case also consumed, while the cabbage, which the animal had last taken, lay in the centre of the stomach unchanged, if we except the alteration which had taken place in the external parts of the mass it had formed, in consequence of its imbibing gastric fluid from the half-digested food in contact with it.

We sometimes found the great end of the stomach dissolved within an hour and a half after death. It was more frequently found so when the animal had lain dead for many hours. This effect does not always ensue, however long it has lain dead. It seems only to take place when there happens to be a greater than usual supply of gastric fluid, for we always observed it most apt to happen when the animal had eaten voraciously.

Why it should take place without the food being digested, is evident from what has been said. Soon after death, the motions of the stomach, which are constantly carrying on towards the pylorus the most digested food, cease. Thus the food which lies next to the surface of the stomach, becoming fully saturated with gastric fluid, neutralizes no more, and no new food being presented to it, it necessarily acts on the stomach itself, now deprived of life, and on this account, as Mr. Hunter justly observes, equally subject to its action with other dead animal matter. It is remarkable that the gastric fluid of the rabbit, which lives wholly on vegetable food, should so completely digest its own stomach as not to leave a trace of the parts acted on\*. I never saw the stomach eaten through except in the large end; in other parts its internal membrane is sometimes injured.

Although the food is in the most digested state in the pyloric end, it appears, both from the fact just mentioned, and several other circumstances, that the change is chiefly effected in the great end of the stomach. The food found in the pyloric end

\* The rabbit will often, when hungry, eat animal food very readily.

is comparatively dry, while that found in the great end, if digestion is much advanced, is mixed copiously with the fluids of the stomach, and there is a more evident difference in the state of the food, before it comes into this part, and when it is about to leave it, than in any other part of the stomach. Dr. Hastings, on examining the stomach of a woman, who had died under his care, found it everywhere in a state of ulceration, except in the great end, where it was healthy. The stomach had performed its functions to the last, and the state of the alvine discharge proved that the food had been properly digested.

If we keep in view the foregoing account of the process of digestion in the rabbit, it will be interesting to trace the effect produced on it by depriving the stomach of a great part of its nervous power, by dividing the eighth pair of nerves in the neck.

The division of this pair of nerves is one of the oldest physiological experiments of which we have any account. It was performed by several of the ancients, and has been repeated by a great many physiologists in modern times. Valsalva is among the first who gave any distinct account of its effect on the stomach. Haller, and many others, repeated it, and described its effect on this organ\*.

If the animal be allowed to live for a considerable time after these nerves are divided in the neck, and one portion of each folded back, the food remaining in the stomach, we have seen, if the animal has lately taken a full meal, is always found undigested, and nearly in the same state in all parts of the stomach; a circumstance which I was at first greatly at a loss to explain. This effect is uniform, I never saw it otherwise. Yet we must conceive, that at the time the nerves were divided, there was some food more or less digested in its stomach, and some gastric fluid to act on part of that just received into it. The foregoing statements explain the difficulty. The division of the eighth pair of nerves prevents the due formation of the gastric fluid; but the animal still living, and the motions of the alimentary canal being independent of the nervous power†,

\* See a paper by Dr. Hastings, in the 21st number of the *Journal of the Royal Institution*, on the effects of dividing the eighth pair of nerves.

† *Experimental Inquiry*, chap. vi.

the usual motions of the stomach continue and send onwards into the duodenum, all the food which is digested, and consequently capable of applying to the stomach that stimulus, which excites its natural motions.

Thus it is evident, that the undigested food must at length come into contact with it. As soon as this happens, the usual secretions not being supplied to produce the proper change in the food, an unnatural motion is excited; hence the efforts to vomit, which generally ensue in about an hour, an hour and a half, or two hours, after the division of the nerves, marking the time when the stomach having sent towards the pylorus its digested contents, begins to feel the effects of undigested food coming into contact with it. To these efforts to vomit we must ascribe the circumstance of food being generally found in the passage to the stomach when an animal dies from the division of the eighth pair of nerves; for food is found there, although it is not allowed to eat after the operation. If the animal be allowed to eat after the operation, the efforts to vomit almost immediately ensue, the food, as is evident from the way in which it enters the stomach, directly coming in contact with some part of the small curvature.

Thus we see the cause of the efforts to vomit which follow the division of the eighth pair of nerves; and why, if the animal be allowed to live for a certain time after the operation, nothing but undigested food is found in the stomach. It also appears from the same circumstances, why the stomach is generally more distended than usual after the eighth pair of nerves have been divided, particularly if the animal have been allowed to eat after the operation, all the food not digested by the gastric fluid present before the division of the nerves, remaining in the stomach, and swelling from the heat and moisture\*.

From all that has been said, it appears, that the process which the food undergoes in the stomach is that of being formed into a mass, in appearance nearly homogeneous; that this process takes place only on or near the surface of the stomach, and that, in proportion as the food there situated undergoes the necessary change, it is by the muscular power

\* I have sometimes, but very rarely, seen a small quantity of undigested food in the first intestine.

of the stomach moved onwards towards the intestine, making room for that which next succeeds, till the whole contents of the stomach have undergone this process, the digested contents being regularly discharged into the first intestine, as they arrive at the pylorus, till most, and in some animals all, the contents of the stomach are thus removed into that intestine; from which, after they have for some time been detained, and mixed with the bile and pancreatic fluid, they are continually passing into the adjoining parts of the canal.

When the gastric fluid has not a constant supply of fresh food to neutralize it, it is capable, as appears from what has been said, of corroding the stomach itself, after the vital principle of this organ is extinct; from which it appears probable, that the uncombined gastric fluid may produce some effect on the coats of the stomach during life, and various facts would lead us to suppose that the sensation of hunger arises from the action of this fluid. A supposition which seems to be confirmed by the following experiment.

A person in good health was prevailed upon to abstain from eating for more than twenty hours, and further to increase the appetite by more exercise than usual. At the end of this time he was very hungry, but instead of eating, excited vomiting by drinking warm water, and irritating the fauces. The water returned mixed only with a ropy fluid, such as the gastric fluid is described to be by Spallanzani, or as I have myself obtained from the stomach of a crow. After this operation, not only all desire to eat was removed, but a degree of disgust was excited by seeing others eat. He, however, was prevailed upon to take a little milk and bread, which, in a very short time, ran into the acetous fermentation, indicated by flatulence and acid eructations.

It seems an inference from this experiment, that the pains caused by hunger may be prevented by constantly exciting vomiting; and thus the death which arises from it, converted into that from inanition, which only proves fatal after the lapse of some weeks. People live for weeks without food in fevers, where there is no secretion of gastric fluid.

It would appear then that one of the uses of the gastric fluid is, by its action on the coats of the stomach, to remind us when a supply of food is necessary.

We have reason to believe, from the result of the foregoing experiment, as well as from other circumstances, that in man the stomach is capable of propelling the whole of its contents into the duodenum. In a case of indigestion, I saw orange-juice which had remained on the stomach for twenty-four hours, brought up by vomiting, unmixed with any thing, and apparently little, if at all changed. In this case there was no appetite, and no secretion of gastric fluid.

Having traced the different steps of the process of digestion in the healthy stomach, we are better prepared to understand the operation of the causes which disturb it.

## SECTION II.—*Of the Remote Causes of Indigestion.*

In considering the remote causes of this disease, the attention, we shall find, must be as much directed to the sympathy of the alimentary canal with other parts of the system, as in enumerating its symptoms; for as the whole system is essentially influenced by the affections of that canal, and some parts peculiarly so; in like manner it is influenced by affections of the system in general, and particularly of those parts. The remote causes of indigestion, therefore, may be divided into those which act directly on the stomach and intestines, those which act on other parts, and those which affect the whole system.

It may be proper here to call the reader's attention to a circumstance which greatly influences the phenomena of diseases, and, in particular, tends to render them protracted and difficult of cure. The affections, whether primary or secondary, of parts which sympathize, influence the state of each other. Thus sympathetic affections, provided they have not been converted into actual disease of the part, in which case, we have seen, they relieve the original disease, become causes which support and aggravate it. The debility of the skin, for example, occasioned by indigestion, so reacts on the digestive organs, as to increase their disease. Similar observations apply to the sympathetic affections of the liver, the brain, &c., produced by the diseased state of the stomach; and the symptoms are further aggravated by the increase of general debility caused by these affections. It is thus that the evil increasing,

if I may be allowed the expression, in a geometrical ratio, and not by simple addition, the whole powers of the system, in severe attacks of disease, often sink with a rapidity which at first view appears unaccountable. We shall find these facts strikingly illustrated in considering the causes and treatment of indigestion.

It is evident from what has been said of the function of the stomach, that it may be deranged in two ways; either by causes affecting its secreting power, so that the proper chemical change is no longer effected in the food; or by such as debilitate its muscular power, so that the food though properly changed as far as it is brought in contact with the proper parts of the stomach, is neither duly so brought, nor regularly propelled into the first intestine.

It appears from the experiments related in the *Inquiry into the Laws of the Vital Functions* above referred to, that the muscular fibre, though independent of the nervous system, may in every instance be influenced through it. It follows, therefore, that the muscular fibres of the stomach may not only be affected by causes acting directly on them, but by such as act through the medium of their nerves.

Among the chief causes of indigestion, which act directly on the muscular fibres of the stomach, are narcotic and other offensive substances received into it. I have found that although opium, applied to the external surface of the alimentary canal and heart, produces no sensible effect on their muscular power, applied to their internal surface it produces the same effect as when directly applied to the muscular fibres themselves\*; impairing their power, unless the quantity be extremely minute, and instantly destroying it if the quantity be considerable.

It has been questioned whether the opium pervades the fine internal membrane, and acts directly on the muscular fibres, or affects these fibres through the nervous extremities distributed on this membrane. The former appears to be the case, because we know from experiment that the nerves cannot convey the impression of such agents. Besides till it transudes through the membranes, it is no more in contact with the nerves

\* *Inquiry into the Laws of the Vital Functions*. Page 133, *et seq.*, third edition.

than the muscular fibres. We know that the bile is capable of transuding through the coats both of the gall bladder and intestines, and that many of the functions of the animal body depend on the transudation through membranes of chemical agents.

It is probable that other offensive substances acting on the stomach, tobacco, distilled spirits, strong peppers, those of an acid or putrid nature generated in the stomach itself, &c., may also in the same way immediately affect the muscular fibres. All these substances, however, as will presently appear, otherwise influence the state of the stomach. We have reason to believe that the reception of large quantities of very warm or very cold fluids directly affect these fibres. It is not uncommon for a fit of indigestion to be induced by taking suddenly considerable quantities of iced fluids. Violent and repeated vomiting also debilitates the muscular fibres of the stomach. But of the causes which immediately affect them, the most frequent and powerful is morbid distention. We know that the muscular power of the stomach, intestines, and bladder, and we have reason to believe that the same observation applies to the heart and other similar cavities, may for the time be wholly destroyed by over distention. The stomach may be so distended that the most powerful emetics will not excite vomiting\*, notwithstanding the muscles sympathetically excited in this operation, those of the abdomen and diaphragm, are thrown into strong and repeated action; one among many proofs, that however necessary the action of these muscles in vomiting, it is by that of the stomach itself that its contents are rejected. The abdominal muscles excite the action of the stomach in this operation, in the same way that the same action of these muscles, though less sudden and powerful, excites the bladder and rectum. So perfectly the same indeed are these actions, that if the bladder and rectum are sufficiently distended at the time of vomiting to be effectually excited, their contents also are discharged, unless retained by a voluntary act exciting their

\* The reader will find some good observations on this subject, and cases illustrative of them, under the head of *Gastritis*, in *Eller's Work, De Cog. et Cur. Morbis*. I also beg leave to refer him to my treatise on *Symptomatic Fevers*, page 231. Fourth edition.

sphincters. In all these instances the action of the hollow muscle is excited by being pressed against its contents by the abdominal muscles and diaphragm.

The most common cause of morbid distention of the stomach is eating too fast ; for the appetite only subsiding in proportion as the food combines with and neutralizes the gastric fluid, previously in the stomach, when we eat too fast, before this combination is completed, so much is taken that the whole gastric fluid, which the stomach is capable of supplying during the digestive process, is not sufficient to effect the due alteration on it ; whereas when we eat slowly, the appetite abates before the stomach is overcharged : for while digestion is going on, and the gastric fluid is only supplied in proportion as fresh food comes in contact with the coats of the stomach, it combines with the food as it is formed, and never excites the appetite.

Every one has occasionally observed, that if his meal be interrupted for ten or fifteen minutes after he has eaten perhaps not more than half the usual quantity, he feels that he is satisfied. The gastric fluid which had accumulated has had time to combine with, and be neutralized by, the food he has taken. It is for the same reason that a few mouthfuls taken a little before dinner will often wholly destroy the appetite, especially in delicate people, in whom the gastric fluid is secreted in small quantity, or of a less active quality. Frequent interruptions in eating would be injurious, because we should thus be prevented from taking the proper quantity of food, for digestion seems chiefly performed by the fluid which is secreted, as fresh food comes in contact with the stomach ; and the time which that which has accumulated requires for its neutralization, which of course must be greater or less according to the accumulation which has taken place, that is, generally speaking, according to the length of our fast, is the proper measure of the quantity which ought to be taken, provided we continue to eat, without devouring, our food.

Another frequent cause of over-distention of the stomach is high-seasoning and great variety of food, or such as particularly pleases the palate, by which we are induced to eat after the appetite is satisfied ; or by the stimulus of the high seasoning a greater supply of gastric fluid than the food calls for is excited,

and thus the appetite prolonged. This seems in particular to be an effect of wine drank during dinner. This practice, although it occasions less immediate inconvenience than eating too fast, often, if carried very far, by the preternatural excitement of the stomach, at length impairs its vigour. It is not uncommon in those who have greatly indulged in the pleasures of the table, to find the stomach enlarged, and its fibres sensibly relaxed.

The degree of distention which the stomach undergoes also depends much on the kind of aliment. All food appears to swell more or less after it is received into the stomach; some kinds more than others, and of course that which is most difficult of digestion, *cet. par.*, swells most; both because it is digested and removed from the stomach most slowly\*, and because that which most resists the action of the gastric fluid is most apt to run into fermentation. In considering the treatment, I shall have occasion particularly to point out the diet most easy of digestion.

It is not by its effects on the muscular fibres of the stomach alone, however, that over-distention tends to produce indigestion. Its operation on the nerves of the stomach themselves is equally injurious. It is by this effect that it produces that peculiar pain, restlessness, and sense of oppression, which attend an over-distended stomach. Such irritation of the nerves of a secreting surface cannot exist without affecting its secreting power†. The gastric fluid becomes less capable of its functions, and thus the distention is increased, and other evils induced. The contents of the stomach, not being duly changed, acquire morbid properties, and various symptoms detailed in the first chapter supervene.

But morbid distention is only one among many causes which may derange the nervous powers of the stomach, and thus

\* See what was said in the last Section of the Nature of the Digestive Process.

† It appears from the experiments detailed in *An Inquiry into the Laws of the Vital Functions*, to which I have frequently had occasion to refer, and in *The Journal of the Royal Institution*, that the nervous power is immediately essential to the changes which constitute secretion. I beg leave to refer the reader to papers on this subject, which the Editor of the above-mentioned Journal did me the honour to publish in the Eighteenth, Twenty-first, and Twenty-third Numbers of that Work.

vitiate its secretion. It is probably in this way, in part, that many of the causes which have been mentioned operate. Others appear to make their impression wholly on the nervous system, only secondarily affecting the muscular fibres of the stomach; the passions in excess, particularly grief and anxiety, long-continued application to business, severe study, and whatever else strains the powers of that system. Strong impressions of the mind often instantly destroy the appetite. This may arise either from their occasioning such a secretion of gastric fluid, as, not possessing healthy properties, at once itself fails to apply the due stimulus to the stomach, and tends to vitiate the effect of that which had been previously secreted; or by their so affecting the nerves of the stomach, that the gastric fluid no longer produces on them its usual effect.

Indigestion sometimes arises from mechanical pressure, either of the stomach itself, or other parts of the alimentary canal, from tumors or indurations of neighbouring parts, or from extraneous bodies lodged in any part of the canal. These causes are comparatively rare.

Others have a more complicated operation, not only directly affecting the powers of the stomach, but influencing it at the same time by their operation on other organs, with which it particularly sympathizes. In intoxication, the stomach not only suffers from the morbid stimulus of the intoxicating fluid, but in consequence of its effects on the brain. Similar observations apply to a cold and moist atmosphere. The stomach not only suffers by the general debility and relaxation induced on the nervous, and, through it, on the muscular system; but also by the peculiar effects of such an atmosphere on the office of the skin. Thus, too free a use of calomel and other medicines, which powerfully affect the abdominal surfaces, not only injures the stomach by their direct effect on this organ, but by the disorder excited in parts with which it immediately sympathizes.

Some causes of indigestion affect the stomach chiefly by sympathy. The principal of these are various affections of the bowels; the most common, long-continued constipation. We find instances of the same kind in the indigestion produced by diseases, and even accidents affecting the head, by stone in the bladder, &c.

So extensive, indeed, are the sympathies of the stomach, that whatever greatly disorders the function of any important organ may be ranked among the causes of indigestion; its tendency to produce this disease being proportioned to its degree, and the degree of sympathy which exists between the stomach, and the part primarily affected.

It seems chiefly by their effects on the general system, that indolence, and debility arising from long-continued disease, or other causes, not unfrequently prove the exciting cause of indigestion.

All the exciting causes of this disease, applied in a less degree, act as pre-disposing causes.

Among its chief pre-disposing causes may be ranked variable weather. The influence of the spring, indeed, seems often to act as the exciting cause in the pre-disposed, and, from its tendency to induce the inflammatory diathesis, particularly disposes to the symptoms of the second stage, in those who have for some time laboured under the disease. The latter may also be said of taking cold, and all other causes of inflammation.

The period of life from puberty to about thirty, and old age, and in some an hereditary disposition, also pre-dispose to indigestion. It is common to find the descendants of those who have suffered much from this disease labouring under it. Much has been said of the nature of hereditary disease; all that is necessary for us to know, is the fact, which cannot be disputed, that those parts which were most liable to disease in the parent, are likewise found so in the children; but neither is this universally the case, nor does the disease necessarily take place when the disposition to it exists.

### SECTION III.—*Of the Immediate Causes of Indigestion.*

The immediate causes of a disease are the states of body induced by the remote causes, and from which all the symptoms, more or less, directly arise. A knowledge of these causes is of the greatest importance in conducting the treatment. Where we are altogether ignorant of them, the treatment is founded either on the simple principle of employing the same means

which have formerly proved useful, or on our general knowledge of the laws of the animal economy. It is only in proportion as we are acquainted with the immediate causes of a disease, that our endeavours can be directed to restore the due functions of the parts affected; and in the instances in which, after having long treated diseases on the vague principles which are our only guides when the immediate causes are wholly unknown, we have at length arrived at a knowledge of these causes; we perceive that many parts of our former plans were superfluous, and not a few, although affording some present relief, injurious.

In *angina pectoris*, for example, before it was known to depend on an obstructed circulation through the heart, the stomach was oppressed with a constant succession of anti-spasmodic medicines, because the symptoms are similar to those which we know, from the general laws of the animal economy, spasm of certain parts produces; and recourse was had to warm stimulating medicines, which the debility, necessarily attendant on the state of the circulation, seemed to call for.

As soon as dissection unfolded the nature of the disease, it was evident that anti-spasmodics, however they might relieve certain symptoms, and consequently be proper for immediate relief, can do little towards preventing the recurrence of the attack; and that those medicines which increase the flow of blood to the heart, already incapable of duly transmitting the usual quantity, tend to hasten the fatal termination.

In endeavouring to trace the immediate causes of a disease, there are two objects which demand attention; the change produced in the seat of the disease by its remote causes, and the manner in which this change produces the symptoms. Without a knowledge of the first of these, our principles of treatment must be vague; without that of the other, they cannot be adapted to individual cases. To recur to the disease just mentioned; till we knew that *angina pectoris* arises from the difficulty with which the blood is transmitted through the heart, our only principle of treatment was to relieve the most urgent symptoms; and now that we are acquainted with this cause, if we could not distinguish what symptoms im-

mediately depend upon it, and what are secondary, arising from sympathy and peculiarity of constitution, our plans, it is evident, could not be suited to the case under treatment.

The first part of this subject has already been considered. It is evident, from what has been said in the first and second sections of this chapter, on the one hand, that any cause which produces indigestion must necessarily debilitate either the muscular or nervous power of the stomach, or both, on which we have seen its function depends; and on the other, that all the causes above enumerated are evidently such as must have this effect. In considering the remaining part of the subject, the manner in which debility of the muscular and nervous powers of the stomach produces the symptoms of indigestion, we shall separately consider those of the first and second stages of the disease.

Little need be added to what I have already had occasion to say of the symptoms which are confined to the stomach itself. As the food can only be regularly propelled into the duodenum by the due action of the muscular fibres of the stomach, it is evident that if this fails, oppression and distention must ensue; and if the due secretion of the gastric fluid depend on the healthy state of the nervous power of the stomach, its properties must be affected by any cause disordering this power, and it will consequently fail to produce the due change on the food.

As it appeared, from what was said above, that the causes debilitating the muscular power of the stomach, by the derangement which every morbid affection of this power occasions in the digestive process, soon affect the nerves of that organ; it may now be observed, that all causes affecting the nervous power of the stomach, independently of the direct action of the nervous on the muscular power, by preventing the food from being formed into that substance which is the natural stimulus to the muscular fibres of the stomach, enfeebles their action; which we have seen is wholly prevented, if the cause affecting the nerves be so powerful as entirely to prevent the due change on the food, as happens when the eighth pair of nerves is divided, and the cut ends displaced. The morbid distention and the undigested food thus constantly applied to the surface of the stomach, still increase the debility of both nervous and muscular powers. So complicated is the operation even of

those causes of disease, which at first view appear the most simple.

The manner in which a morbid affection of the muscular or nervous power of the stomach produces the symptoms of indigestion affecting distant parts, is by no means so evident. The first question which arises is, Why does the influence of affections of the stomach, and other vital organs, extend through all parts of the system; while the powers of the organs of sense, parts of equal sensibility, may not only be deranged, but wholly destroyed, without affecting the function of any other part? It may be said because the latter are not organs essential to life. This reply, it is evident, relates to the final, not the efficient cause. I need hardly observe, that I here speak of the functions of the organs of sense, not of the powers which sustain them. These are as much vital powers as those of the stomach. If the sentient extremities of the nerves of the eye or ear be deranged by electricity, for example, sight or hearing are lost, but there the evil ends. If those of the stomach be deranged by the same means, with the function of the stomach every other function of the system is lost; not in consequence of the failure of the digestive process, but instantly. If, instead of a chemical, we employ a mechanical agent,—a sudden blow, for example,—the same difference of effect is observed. On the cause of this difference, it is evident that many of the symptoms of indigestion depend; for the effects of the various states of the stomach, in the different stages of this disease, are instantly propagated to the most distant parts of the system. We see the extremities become hot or cold, moist or dry; the functions of the brain or heart immediately fail, and as quickly revive from causes acting on the stomach alone.

If we compare the foregoing facts with the result of experiments, which prove that the vital organs are supplied with nervous influence from every part of the brain and spinal marrow\*, while the organs of sense derive theirs only from particular parts of them; it seems a necessary consequence, that the one set of organs cannot be injured without influencing every part of the system, while in injuries of the other, only those parts of the general source of nervous influence

\* *Experimental Inquiry.* Part ii. chap. 9.

from which their own nerves arise being affected, the evil extends no farther.

It appears from what has been said, that juxtaposition is one of the most powerful causes of sympathy. We see textures of the most dissimilar nature, receiving their nerves and vessels from the most distant sources, immediately partaking of the affections of each other if they lie together. Inflammation of the skin of the chest often spreads to the intercostal muscles, to the membrane of the ribs, to that of the lungs, to the lungs themselves. The same observations apply to the other cavities, for the interposition of bone itself does not always prevent this progress. This well-known fact is often of great consequence, in tracing the causes and explaining the phenomena of diseases. We shall find it so in the disease before us.

When the cause of injury applied to the vital organs is very great, as in the cases above-mentioned, all parts of the system are equally affected, the power of all being immediately destroyed. But when the cause is comparatively slight, the effect on the parts which most sympathize with these organs may be considerable; while on others it is hardly to be observed. Thus, the effects of irritation of the stomach appear in the liver, the skin, the head, when they are not to be perceived in other parts; but as the disease increases, as we find from the above enumeration of its symptoms, they become sensible in every part.

We find from the experiments related in the seventh chapter of the above-mentioned *Experimental Inquiry*, that any diminution of the extent of the organs which supply the nervous power, affects the state of the secreting surfaces, and impairs the temperature; and Mr. Brodie had observed similar effects, particularly with respect to the temperature, from powerfully debilitating causes affecting these organs. It cannot, therefore, seem surprising that in derangement of the digestive organs, which so greatly debilitates the powers of the nervous system, and which, when excessive, we have seen, is even capable of at once destroying its powers, diseases of other parts of the body, and particularly of those which most sympathize with these organs, should frequently arise, and be difficult of cure. It appears from what has been said of the progress of indigestion, that wherever sympathetic affections are long continued, or frequently renewed, actual disease is apt to ensue.

The foregoing observations are well illustrated by, and readily explain, Mr. Abernethy's valuable *Observations on the Constitutional Origin of Local Diseases*. He found, that many wounds, which resisted all the means which the surgeon could employ, were attended with a disordered state of the digestive organs, and yielded readily when the due performance of their functions was restored; nay, that many wounds and other local diseases had no other origin than the states of health which attend irritation of the stomach and bowels.

It is also to be observed that the failure of nervous power appears more readily in some of the nervous functions than in others. In indigestion, before the other functions of the surface are much impaired, the patient complains of a sense of cold; and when, by degrees, the failure of these becomes apparent, the sensation of cold, an actual reduction of temperature, and a less than natural ability to resist its extremes, still continue to form a predominant feature of the disease; for we have seen that dyspeptics are as unable to bear extreme heat as cold.

All that is here said we still find strikingly illustrated by the operations of nature in other cases. It appears from the observations of Mr. Earle, in a paper *On Animal Heat*, in the seventh volume of the *Medico-Chirurgical Transactions*, and of Mr. Guthrie, in his work *On Gun-Shot Wounds*, that when the nerves of a limb are injured, all its functions are impaired. It is more liable to ulceration than a sound part. Inflammation does not take its usual course in it, and wounds in it heal with greater difficulty than usual. A diminution of temperature, however, and an inability to resist changes of temperature, are, from the first, the most striking features; and the limb remains below the natural degree for months, or even years, if the nervous power is not perfectly restored.

The preceding observations show, not only that those symptoms of indigestion which affect parts at a distance from the stomach, may arise from other causes lessening the power of the nerves, whether acting as affections of the stomach do, on the whole nervous system, or only on the nerves of the parts chiefly affected; but that the order and general character of the symptoms, thus produced, are the same as when they arise from indigestion; pointing out in a striking manner the similarity of their cause.

When the whole of the facts which have been laid before the reader, in this and the preceding sections, are kept in view, it seems easy to point out in what way the remote causes of indigestion operate in producing all the symptoms of what I have called the first stage of this disease. The debility induced by these causes on the muscular and nervous powers of the alimentary canal, on the one hand, by preventing the due change on the food, and its due discharge into the duodenum, and progress throughout the rest of the canal, produces the symptoms which immediately arise from undigested food; and, on the other, either by its direct effects in the stomach and bowels, or through the irritation of the undigested food and vitiated secretions, excites the nervous derangements which affect these cavities, and in the way just pointed out, other parts with which they sympathize.

But in the second stage of the disease, we see a change which cannot be referred to either of these heads, I mean, the occurrence of tenderness in the part of the region of the stomach above described, which hardly ever fails to supervene in protracted cases, and, when considerable, to be accompanied with a pulse which will be found more or less tight, or, as it is more usually called, hard, if examined in the way above pointed out \*, and some of the other indications of fever which have been enumerated. I am now to lay before the reader such facts as seem to throw light on the nature and more immediate cause of those symptoms which we shall find greatly influence the treatment of the disease.

I have had occasion to call the reader's attention to many facts which prove that irritation is often felt in a part at a distance from that to which the irritating causes are applied. Now, whatever may be said of the way in which any cause of irritation affects the part to which it is applied, it is evident, that it can only affect a distant part through the medium of its nerves. Thus, when worms in the intestines produce pain of the chest, difficulty of breathing, &c., we know that these symptoms are produced through the medium of the nerves, and by watching their effects we are enabled to determine, what the effects of mere irritation of the nerves are.

It appears from what was said above, that this irritation, in

\* Chap. i.

the first instance, produces no sensible change in the part sympathetically affected. If the worms are removed from the intestines within a few hours after the pain, the difficulty of breathing, and other pectoral symptoms have supervened, they immediately disappear; and the lungs perform all their functions as well as if no symptom of disease had existed. But we have also seen, that if these sympathetic symptoms remain for a certain time, inflammation of the lungs takes place, and they exhibit, on dissection, all the marks of this disease, suppuration and its other consequences not excepted. Other instances of the same kind were adduced, and it would be easy to multiply them\*.

Thus it appears that irritation of the nerves of a part may exist for some time without any change taking place in the state of its vessels; and when the cause of irritation is not severe, and the part little disposed to disease, this may be the case for a long time. Pain of the shoulder often continues for months in chronic affections of the liver, without the shoulder becoming stiff, or tender to the touch. It also appears, however, that the continuance of the nervous affection, sooner or later, according to its degree, and the tendency to disease in the part

\* Since the publication of the first edition of this Treatise, Mr. Brodie has favoured me with the following letter, containing an account of an important experiment which he made many years ago, and some valuable observations, which seem strikingly to illustrate this part of the subject, and which he has had the goodness, at my request, to permit me to make public.

“My dear Sir,—The following are the particulars of the experiment to which you have alluded:—

“On the 29th of June, 1814, I exposed the nerves of the eighth pair in the neck of a rabbit, and, by means of a fine needle, I passed a silk thread transversely through the substance of each nerve, in the manner of a small seton. The extremities of the threads were left hanging out of the external wound. This operation did not produce any immediate effect on the respiration; but at the end of twenty-four hours the animal was observed to breathe, in a laborious and difficult manner, twenty-eight times in a minute. The threads were withdrawn, but the removal of them occasioned no relief, and fourteen hours afterwards the rabbit was found dead. On dissection, both lungs were seen loaded with blood and inflamed. The left lung was inflamed in the greatest degree, the surface of it being incrustated with coagulated lymph, and lymph being effused also in several places in the intertubular substance and auricles. There was a considerable quantity of serum in the cavity of each pleura.

“The stomach and intestines were in a natural state, presenting no appearance of inflammation. The gall-bladder was nearly emptied. A

sympathetically affected, influences the state of its vessels, producing inflammation and its consequences. The effect, which thus takes place in a distant part, must, of course, take place more readily in that to which the cause of irritation is applied.

Now it appears from what was said in the second Section of this Chapter, that all the causes of indigestion act either directly or indirectly on the nerves of the digestive organs. This irritation of the nerves must sooner or later produce the same effects here, as in other parts, and the vessels at length partaking of the disease, some tendency to inflammation must ensue. This is indicated by the symptoms above-mentioned, a tenderness on pressure in the part affected, tightness of the pulse, and other febrile symptoms, which under all circumstances, indicate inflammation, or a state approaching to it.

As the tenderness of the epigastrium is always the first of these symptoms, and the others are proportioned to it, and yield, as we shall find, to the means which relieve it; it is evident that they all arise from it. It is, therefore, a point of great importance, in the treatment of the disease, to ascertain, with precision, the seat of the derangement which occasions

slight degree of inflammation existed in each nerve, but only at the part where the seton had been introduced.

“ It appeared to me that, in this experiment, the inflammation of the lungs might reasonably be attributed to the irritation produced by the threads on the nerves, by which they were supplied. A multitude of other circumstances might be adduced in proof of the doctrine, that simple nervous irritation is capable of producing local inflammation, even at a distance from the part in which the source of the irritation exists. A calculus passing down the ureter occasions pain in the testicle; and if a certain length of time elapses before the calculus escapes into the bladder, this symptomatic pain is followed by swelling, tenderness, and no small degree of inflammation of the testicle. In like manner, in some cases of disease in the hip, the symptomatic pain in the knee is attended at last by tenderness and puffy swelling of the latter articulation; and in many instances in which suppuration takes place slowly on the membrane of the brain, after an injury of the head, the patient becomes affected with inflammation and abscesses of the lungs, liver, or some other organ remote from the seat of the original malady.

“ I have much pleasure in being able to communicate to you these observations, in confirmation of the opinions which you have expressed and published on these subjects, and I am, dear Sir, yours, very truly,

“ B. C. BRODIE.”

“ *Saville Row, Oct. 26, 1821.*”

this tenderness, and consequently the nature and function of the part in which it occurs.

It is evident that, of the different parts of the stomach, its lower orifice is the one most exposed to causes of irritation. Other parts experience the irritating effects of different portions of its morbid contents, but this orifice is necessarily exposed to all. All must pass by it. When, therefore, we see that, after indigestion has continued for some time, a certain part of the region of the stomach becomes tender on pressure, we cannot help turning our attention to that orifice. Now in the natural situation of the viscera, exactly in the tender part, as I ascertained with the kind assistance of the late Mr. Brooks, whose anatomical skill is so generally acknowledged, the lower orifice of the stomach lies, with the thin edge of the liver upon, and in contact with it.

When all these circumstances are considered, can we doubt that it is the irritated pylorus, suffering from what may be termed a low degree of inflammation, which occasions the tenderness on pressure above described; and when we find the tenderness with some degree of fulness gradually extending downwards, along the soft parts on the edge of the cartilages of the right side, as we often find it to do in the progress of indigestion, attended with the symptoms above enumerated indicating a disordered state of the bile, and at length ending in evident enlargement and tenderness of the liver, and consider what has just been said of the influence of juxtaposition in the spreading of inflammation, can we hesitate to infer that the affection of the pylorus is communicated to the thin edge of that organ with which it is in contact, thence by degrees extending to its other parts? Thus it is that of all the neighbouring parts no other so frequently partakes of this affection of the stomach. It is, doubtless, in the same way that the habit of drinking spirits, which must apply so great a degree of irritation to the pylorus, seldom fails to produce affections of the liver.

We have reason to believe that it is from its greater exposure to causes of irritation, that the pylorus itself is more subject to organic disease than any other part of the stomach; but this organ, necessarily so much exposed, appears to be endowed with a great power of resisting disease; so that the first

deviations from the healthy state, which are communicated from it to the liver, more readily take root there, if I may be allowed the expression ; and the structure of this organ yields to the affection which the part, where it originated, generally resists. The liver indeed is here already disposed to disease, its action, we have seen from an earlier period, having by sympathy been influenced by the state of the stomach, and the continuance of diseased action, disposing to disease of structure.

The fulness of the right side of the abdomen, however, so common an attendant on indigestion of long standing, especially when it extends pretty far down, even when combined with tenderness on pressure, does not usually arise from any organic affection of the liver, but appears to be chiefly the consequence of a distended state of the duodenum, which imperfectly expels its contents, in consequence of its partaking of the debility of the stomach ; and of the bile, from the deranged function of the liver becoming less capable of exciting it. It has been stated, in enumerating the symptoms, that the fulness and tenderness of this part in the early stages of indigestion are often temporary. I have repeatedly seen them, even when they were considerable, disappear after the operation of a brisk aperient. Whether they arise from the cause just mentioned, or are the effects of distention of the vessels or gall-tubes of the liver, in which case also the same means, particularly if the aperient be mercurial, will also for the time relieve them, the accompanying symptoms will generally enable us to determine. The feeling given to the hand by the distended duodenum is less firm, and also in other respects different from that produced by the gorged liver ; and in the former case the chief fulness is generally lower down, and does not seem to proceed so immediately from under the edge of the thorax as general fulness of the liver does. The greater softness and less defined nature of the tumor occasioned by both these affections, with the other symptoms and history of the case, for the most part readily enable us to distinguish them from fulness and tenderness of the same region arising from organic disease of the liver\*.

\* My experience tends to confirm many of the observations made by Dr.

As there may be some difference of opinion respecting the part of the intestines where the accumulation I refer to the duodenum takes place, I shall here state my reasons for believing it to be in this intestine. At first view it might seem easy to ascertain the point by inspection after death, but the mere affection of the alimentary canal itself, such as usually attends indigestion, never proves fatal; and in other affections, whether induced by the irritated state of that canal, or accidentally combined with it, death is generally preceded by long-continued abstinence, during which, under all circumstances, this accumulation is generally lessened or removed. We are therefore left to ascertain its seat from the symptoms of the disease, the nature, position, and office of the different parts of the alimentary canal, and the effects of the means employed. These, if carefully considered, will, I think, leave little room for doubt.

The duodenum lies exactly in the seat of the fulness, and where the fulness is greatest forms a kind of pouch; for having descended to this place, it rises to a higher part of the abdomen, and from its form and structure, as well as position, it would seem the intention of nature that its contents should for some time be detained. This seems also pointed out by its office, for the food is there mixed with the bile and pancreatic juice. It is also not only wider, but more dilateable than other parts of the small intestines, so that it has even obtained the appellation of a second stomach. The other parts in the same region are other parts of the small intestines, in which there is no position particularly calculated to detain their contents, nor any peculiar function to be performed; and the ascending part of the large intestine, whose contents when delayed cause a fulness which is firmer, more circumscribed, and lies rather more to the right side of the abdomen than that we are considering.

But the circumstance which, compared with what has just been said, seems to leave no room to doubt that the duodenum is the seat of the accumulation in question, is, that I have almost constantly observed that the more severe nervous symptoms which attend indigestion, when it is the original disease,

Yeats in his excellent paper on the duodenum, in the last volume of the *Transactions of the College of Physicians*.

are in the same patient proportioned to the degree of this accumulation, and generally disappear on its removal. Now it is well known that the sympathy of the alimentary canal with other parts of the system increases as we approach the stomach in either direction. The system sympathizes more with the affection of the gullet than the mouth, more with the affection of the duodenum than with more distant parts of the small intestines, and more with these than with any part of the large intestines. The colon may sometimes be felt loaded with its contents almost in a hardened state, with much less general derangement than often arises from such a fulness of the region I am speaking of as can only be perceived by an attentive examination. What is here said is well illustrated by the difference of the fever and other symptoms excited by inflammatory affections of the small and large intestines.

Such are the circumstances from which we have reason to believe that the fulness in the region of the duodenum, observed in the more protracted cases of indigestion, arises from this intestine not perfectly discharging its contents, in consequence of which more or less accumulation takes place in it. But to ascertain the precise seat of the accumulation is a point of secondary importance; it is enough to know that the state of this part of the abdomen, ascertained in the way above pointed out, is so connected with the progress and different states of indigestion as to afford a means of judging of its state, and consequently of regulating its treatment. I shall have occasion to make some additional observations on this subject in speaking of the more protracted forms of the disease.

If what has been said respecting the state of the pylorus be duly weighed, the inference seems unavoidable, that an inflammatory affection, or a state approaching to it, of this orifice, excited by the passage into the bowels of the irritating contents of the stomach of the dyspeptic for a longer or shorter time, according to the nature of these contents, and the greater or less degree of inflammatory tendency in the part, is the cause of the tenderness observed in the region of this orifice of the stomach in the second stage of indigestion, which at first is generally confined to a space not larger than a shilling; an inference confirmed by dissection, which often exhibits the internal membrane of the pylorus redder than usual, and

thickened, and in some cases even abraded, in those who have suffered much from disease of the digestive organs.

It appears from many experiments detailed in the introduction to my *Treatise on Symptomatic Fevers*, and which have been carefully repeated by Dr. Hastings\* with the same results, that all the causes of inflammation act by debilitating, and consequently producing distention in the capillary vessels of the part; from which, as appears from the last part of the *Inquiry into the Laws of the Vital Functions*, above referred to, all the phenomena of inflammation seem necessarily to arise.

It is this debility of the finer vessels of the pylorus, therefore, produced by long-continued irritation of its nerves, from which arise, in the second stage of indigestion, the tight pulse and other symptoms of feverishness above enumerated, and by which we shall find the successful treatment of that stage essentially influenced.

It is a point of great importance in the progress of disease, that febrile disease begins with inflammatory action, that is, debility and distention of the finer vessels, and their constant effect, increased action of the larger ones; and at length necessarily produces debility of the nerves: while nervous disease begins with the latter, and as certainly ends in debility and distention of the finer vessels. It seems to be this which renders the chronic inflammation of organs so much more difficult of cure, and apt to run to derangement of structure, than the acute form of the disease. In the former, the functions of the part are more permanently injured. Its nervous power is debilitated before its vessels begin to be distended. The debility of the nerves, and that of the extreme vessels, increase each other; and unless the chain of diseased action can be broken by means which enable the vessels to recover their healthy diameter, for the most part it goes on more or less quickly, sometimes, if the symptoms are mild, very slowly, till the structure of the organ is destroyed.

As such an inflammatory state as that we have been considering may always, I believe, be observed to precede organic derangement of vital organs, and, both on this account and for

\* Dr. Hastings's *Treatise on Bronchitis*.

other reasons, appears to be its immediate cause ; it is of the utmost consequence, in preventing that derangement, to watch the first tendency of the inflammatory action, for here it is in the first stage alone that in most cases it can be effectually counteracted.

While the foregoing changes are going on in the solids, the fluids of the body must necessarily undergo corresponding deviations from the healthy state. In proportion as the flow of nutriment into the blood is lessened, the change effected on the food being more or less imperfect, and as the different secretions fail, the circulating fluids must be subject to various changes. What these are, the present state of our knowledge makes it impossible to ascertain.

In those who have long laboured under indigestion in its more severe forms, the blood is sensibly altered in some of its properties. The proportion both of red globules and lymph is often less than in health, and sometimes it is greater ; the debility induced on the organs of waste, those organs which throw off such parts of the blood as have become unfit for the purposes of the animal economy, being greater than that of the organs of supply, in consequence of which the habit becomes full and the blood too rich, and otherwise unhealthy. Such states of the blood must necessarily affect that of the fluids supplied to secreting surfaces, and from this cause, also, the secretions of the digestive organs must further deviate from the healthy state.

In considering the influence of the different parts of the system on each other, the mind deserves particular attention in the disease before us. The disease itself, we have seen, renders it anxious, irritable, and apprehensive ; and this state of mind, which we have found capable of producing indigestion, cannot fail to influence both its symptoms and progress.

When the reader reviews the various facts which have been laid before him relating to the operation of the remote causes of indigestion, and particularly takes into the account what I have frequently had occasion to recall to his recollection, that the morbid states of all those parts sympathetically affected, till actual disease takes place in them, tend to increase the primary affection, both by sympathy, and by their farther weakening the general powers of the system, he will perceive how

complicated the operation of those causes must be ; and indeed, from reflecting on the nature of the animal body, the variety of parts of which it consists, the variety of functions necessary to produce each result, and the variety of causes which may influence each organ in this complicated structure, we are prepared for such a conclusion.

When the motions of a clock are suspended, we find a wheel clogged, and readily perceive how this cause of derangement has destroyed the action of the machine ; because its action depends wholly on one principle, and consequently all causes impeding its motion must affect this principle. But did the nature of the clock include many principles of action, and were the cause of disorder such as might influence several or all of them, we should seldom find its effect confined to the derangement of one part ; yet, even then the effects of the offending cause would be simple compared to those of a cause of disease ; for, to bring the machine into a state analogous to that of the animal body, and render the effect of its offending causes equally complicated, its different principles of action must not only have, some of them a direct, and all an indirect, dependence on each other ; but, beside this dependence for their actual existence, each must in a greater or less degree be capable of influencing every other, in such a way, that the secondary affection shall re-act on the part first impressed by the offending cause.

In a machine so constituted, until we can trace the manner in which the different principles of action depend upon and affect each other, what possibility is there of ascertaining the change which any cause of derangement has occasioned in it, and there can surely be no expectation of finding it in the disorder of any one part. How vain then was the humoral pathology, and how vain that of the simple, or even exclusively of the living solid ; although the last, which we owe chiefly to the labours of Hoffman and Cullen, must be regarded as an important step towards a true view of the nature of disease.

All the parts of a living body are concerned in its diseases, and it is only as we advance in a knowledge of Physiology, that is, of the nature of the animal functions and their relations to each other, that the deviations from a state of health can be understood.

## CHAPTER III.

*Of the Treatment of Indigestion.*

THE Treatment of Indigestion, like its symptoms, may be divided into three parts, that of the first, second, and third stages of the disease. The two first only, for reasons already given, we are here to consider.

SECTION I.—*Of the Treatment of the First Stage of Indigestion.*

THE first object in the cure of all diseases is to remove the remote causes as far as they still continue to operate. Among those of indigestion, we have seen, that whatever irritates the surface, or occasions morbid distention of the stomach, holds a chief place. It unfortunately happens, that there is a continual tendency in this disease to produce those causes. However well, therefore, we may succeed in removing them, it requires constant attention to prevent their reapplication. To some of its other causes these observations apply with almost equal force, particularly to that inactivity of body, and irritable, anxious, and desponding state of mind, which so frequently cause and are caused by indigestion.

The first part of the treatment therefore which falls under our attention, relates to diet and exercise both of mind and body; and in the slighter and more recent cases a strict attention to these alone, or at most with the assistance of an occasional mild aperient, will often be found sufficient to effect the cure; and the neglect of them will, in all cases, tend to counteract whatever other means we employ.

*Of the Diet in Indigestion.*

THE objects to be kept in view in regulating the diet in this disease, as appears from what has just been said, are, that it shall tend as little as possible to produce either morbid distention or other irritation of the stomach.

Many of the regulations belonging to the first of these heads arise out of what was said in the Section on the immediate Causes of Indigestion. It would appear from the observations there made, that the appetite continues till the first food neu-

tralizes the gastric fluid which had accumulated in the stomach and caused the sensation of hunger. If the patient eats with great rapidity, he will, during the time required for this combination, which is always the longer the more the powers of the stomach, and consequently the gastric juice, is weakened, put such a quantity of food on the stomach as to occasion some degree of morbid distention, which will be greatly increased by the swelling of the imperfectly digested food, and the stomach, for reasons above explained, not propelling its contents with the usual facility into the intestine. Thus it is that the feeling of distention often increases for some time after too full a meal, and, at length, is frequently accompanied with actual pain.

The food, when we eat too fast, is not only received into the stomach in too great quantity, but is swallowed without being duly masticated and mixed with saliva, and therefore without properly undergoing what may be considered the first process of digestion. It is thus presented to the stomach in a state in which the gastric fluid pervades, and consequently acts upon it with more difficulty. In this way eating too fast is injurious even when the patient abstains from taking too much.

For these reasons, to eat moderately and slowly, is often found of greater consequence than any other rule of diet. The dyspeptic should carefully attend to the first feeling of satiety. There is a moment when the relish given by the appetite ceases; a single mouthful, taken after this, oppresses a weak stomach. If he eats slowly, and carefully attends to this feeling, he will never overload the stomach.

Morbid distention of the stomach, however, may take place, although there be no error in either of these respects, if the food, being of such a nature that the fluids of a weak stomach are unable to effect the necessary change in it, run into fermentation.

It is evident that morbid distention, from whatever cause, cannot exist without at the same time occasioning morbid irritation of the stomach. The distention itself has this effect, but as deranged digestion must be the consequence of morbid distention, it can never stop here. All undigested food, however small the quantity, is itself a cause of irritation.

Thus the whole train of symptoms, which constitute a fit of indigestion, may arise either from too large a quantity of food, particularly if carelessly masticated, or from food of difficult

digestion ; most readily, of course, from a combination of these causes. It is, therefore, of great consequence, in regulating the treatment of this disease, to ascertain what kinds of food are most easily changed by the gastric fluid. This is sometimes influenced by peculiarities of constitution, to which no general rules will apply, but it is not difficult to perceive what kind of diet is usually best suited to a weak stomach.

Tough, acescent, and oily articles of food, with a large proportion of liquid, compose the diet most difficult of digestion. It would appear that a feeble gastric fluid, as indeed we might, *à priori*, suppose, does not admit of being much diluted, without having its powers greatly impaired. The diet opposite to this, then, is that which agrees best with dyspeptics. In the first stage of indigestion, a diet, composed pretty much of animal food and stale bread, is the best.

If we except beef and veal, the flesh of old, in general, is more easy of digestion than that of young animals, on account of the greater quantity of mucilage in the latter. All mucilages are of difficult digestion. Even the vegetable mucilages, which in small quantity are generally grateful to the stomach, will oppress it, if taken very freely. They are among the things which, in vulgar language, are called sating, or phlegmy. Whatever produces the feeling known by these terms disagrees with the stomach.

The stronger kinds of animal food, of which beef may be considered the strongest, are most apt to excite fever. On this account we often allow those, recovering from fever or otherwise disposed to it, to eat the animal mucilages, or those meats which contain a great proportion of them, when even mutton, for example, is forbidden. Thus animal jellies and young meats have obtained the name of light ; but this only relates to the tendency to produce fever, for as far as digestion is concerned they are heavier than mutton, and, to many stomachs, than beef. A similar observation applies to the vegetable, compared with the animal, kingdom ; the former are less apt to excite fever, and are therefore called lighter, but they are in general more difficult of digestion.

From what it arises that mutton is to most stomachs so much more easy of digestion than beef, it would be difficult to say. Most kinds of game are of easy digestion. Fish, independ-

ently of the rich sauce with which it is eaten, is, for the most part, less easily digested than the flesh of land animals; and as it at the same time affords less nutriment, it is in both respects less proper for the food of dyspeptics; although from the white kinds being less apt to excite fever, they, like the animal mucilages, have obtained the name of light, a term which so often deceives with respect to what is most easy of digestion, that it is necessary to keep this explanation of it in view.

The meat most mixed with fat, is, *cet. par.*, most oppressive. It is on this account that pork and the tongues of many animals are of difficult digestion. For the same reason, geese and ducks are the most oppressive kinds of poultry. Turkey is more so than fowl, which, next to mutton, is, perhaps, upon the whole, the most digestible animal food in common use, if the skin be avoided. Of the different kinds of game, pheasant is least easy of digestion. The lean part of venison is, perhaps, the most digestible article of diet. Hare and partridge appear to be as much so as mutton. All kinds of meat become more digestible by being kept till they are tender.

Eggs, as far as relates to a tendency to produce fever, may be regarded as of a middle nature between animal and vegetable food. It is a common opinion that they disagree with bilious people, that is, people labouring under indigestion, in whom the disease has extended to the function of the liver; and in many cases it is so. In others, even in this state of the disease, they are easy of digestion. I believe, in general, the best way of eating them is soft boiled, with stale bread, the yolk and white part being mixed together. To a few stomachs the white of egg is particularly oppressive.

Few things are of more difficult digestion than new bread. Every thing, as may be inferred from what has been said of the process of digestion, which by mastication forms a tenacious paste, is difficult of digestion, being slowly pervaded by the gastric juice. So difficult of digestion is such a paste, that I have known more than one dyspeptic, whose stomach could only digest new bread when it was soaked in melted butter. Here one of the articles most difficult of digestion was more easily digested than the tenacious paste which its presence prevented. Even bread sufficiently old, which it never is till it

is quite dry, is frequently oppressive if taken alone, and in considerable quantity. It still forms a mass not very readily pervaded. The sailor's biscuit, or bread toasted till it is hard, often agree better with a weak stomach than bread in other states.

Food is often rendered more indigestible by processes employed with a view to assist the stomach. All articles composed of strong jellies, and food carefully mashed, are oppressive. The coarser division which our food undergoes in mastication is better suited to assist digestion. Most dyspeptics find, that potatoes, for example, finely mashed, although without any admixture, are more difficult of digestion than when properly masticated. During mastication the saliva is freely mixed with them, and a loose mass is formed. When they are mashed, they resist admixture with the saliva, as well as the gastric juice. The same observation applies more or less to sops of all kinds. Bread sopped in tea is much less digestible than when only mixed with it in chewing.

Our food is rendered more easy of digestion by simple roasting or boiling, provided it is not too much done. All meat twice cooked is less digestible, both from its being over-done, and from the sauces with which it is mixed. Beyond a proper degree of roasting and boiling, the art of cookery is nothing, but that of pleasing the palate at the expense of the stomach. There are a few circumstances under which it is proper to bribe the patient to eat; under all others, the refinements of the cook are at variance with the objects of the physician. However imposing the plans of concentrating much nutriment in small compass may at first view appear, we may be well assured, that in such concentration something is taken away from what nature designed for our food, which is useful to us.

It is not generally known, that the most concentrated decoction of beef, so far from affording much nutriment, will not, if unmixed with something solid, even allay the calls of hunger. A person under my care was attacked with severe pain of the face, when even the smallest quantity of any solid food was put on the stomach; a single mouthful of bread never failed to bring on the attack; and, as he at length refused all solid food, he was confined for some weeks to a

strong decoction of beef; but, however strong, and in whatever quantity it was taken, it never satisfied the appetite, and he rapidly emaciated.

Fresh vegetables, on account of their tendency to ferment, are, on the whole, injurious in indigestion. Some vegetables, however, are less so than others. Pease, beans, cabbage, and waxy potatoes, I have found the worst. Mealy potatoes, turnips, and broccoli, among the best. They should always be boiled till they are soft. Raw vegetables of all kinds are oppressive; lettuce appears to be the least so. The tough, thready, and membranous parts of vegetables in particular are of difficult digestion.

Fruits in general are still more so, especially the cold fruits, melons, cucumbers, &c.; next to these, the mucilaginous fruits, gooseberries, pears, &c. Apples and strawberries I have found, on the whole, lightest; but we more frequently find peculiarities in the stomach with respect to fruits than other articles of diet. To many stomachs the most acescent fruits, currants, mulberries, &c., are particularly offensive. All preserved fruits are oppressive,—the large proportion of sugar adding much to their indigestible quality. To some dyspeptics sugar is so oppressive, that I have known many who were obliged to abstain even from the small quantity used in tea, but in this there is great variety. Most stomachs bear acids better than acescents.

Although bread is generally the better for being hard, provided it be properly masticated, all hard and tough animal food, particularly if it be salted, which adds to its hardness, is of difficult digestion. It seems to be from its hardness that smoked meat is oppressive. Hard and tough animal food cannot, by mastication, be reduced to the loose pultacious form which hard bread assumes.

There are few things in common use so oppressive as butter. It is more so than the fat of meat. The fat of mutton is less difficult of digestion than that of beef, and the fat of venison less so than either. The same may be said of the fat of turtle; but all kinds of fat are oppressive to a weak stomach, and that of which we are inclined to eat the most, is generally, on this account, the worst. We have little experience of oil in this

country. From the result of the few trials I have witnessed, I should say that olive oil, to a stomach accustomed to it, is less oppressive than butter, probably than most kinds of fat.

All oily substances are rendered more oppressive by being fried, as in many of our dishes. Such is the peculiarity observed in particular cases, that I have known a dyspeptic digest the fat of bacon toasted, who could not digest mutton; as if the strong stimulus of the former had excited a secretion of gastric fluid, where the milder stimulus of the mutton had failed. Contrary to what happens with respect to other kinds of animal food, the fat of bacon is the most digestible part. If the flame catches it, it is rendered empyreumatic and consequently difficult of digestion. It should be toasted like bread before the fire, and is then easily digested by most weak stomachs. It seems to be on a similar principle that the stomach will often digest a little of any thing for which the patient greatly longs; and that the appetite sometimes increases after we begin to eat.

Cheese is, in general, still more difficult of digestion than either butter or fat. With their oily nature, it combines the hardness and toughness of the dry and compressed curd, which is very difficult of minute division. Milk and cream, with their preparations, are generally oppressive in proportion to their richness: but the same proportion of cream mixed with water is more digestible than milk.

Much seasoning is injurious, both by the unnatural excitement it occasions, by which, for the time, it increases the power of the stomach, at the expense of subsequent debility; and by inducing us to eat too much. If used in excess, it may also, like other strong stimulants, have a more direct tendency to induce the second stage of the disease.

WITH respect to fluids, water is evidently intended for the proper dilution of our food. As, on the one hand, we have seen, the food may be so watery that it too much dilutes the gastric fluid; so, on the other, it may be so dry, that this fluid cannot easily pervade it, and its necessary motions in the progress of digestion are effected with difficulty.

But these are not the only, nor do they appear indeed to be the principal purpose for which we are induced to drink;

which seems generally to be, to supply the waste of moisture occasioned by the various secreting surfaces, and particularly by the skin, which is the most extensive. Hence every thing which promotes perspiration increases thirst. For a similar reason diarrhœa, and the operation of an aperient, have the same effect; and it appears from many facts, that there is often a rapid absorption of fluid from the stomach.

In health, when the various functions are in due proportion, little liquid is required with the food, the inhalation by one set of vessels nearly compensating for the exhalation by others. The most healthy are little troubled with thirst. In indigestion, we have seen, it is a frequent symptom. It seems sometimes to arise from a general failure of the secretions of the alimentary canal, from the mouth downwards, more frequently from irritation of the stomach, excited by the undigested food; for there is a false thirst, as well as a false appetite. As that irritation frequently induces the patient to eat when there are no fluids in the stomach adapted to the office of digestion; it excites him to drink when there is no want of fluidity in the various juices of the body; and when, so far from there being a want of liquid in the stomach, it is surcharged with vitiated fluids.

The drink, under such circumstances, only giving relief in proportion as it dilutes the irritating matter, the thirst returns as soon as its irritating properties again increase by its continued fermentation; or perhaps merely as soon as the stomach has become accustomed to the degree of relief which the last draught procured. In this way dyspeptics often drink vast quantities, greatly distending the stomach, and increasing their disease.

There is some difference of opinion respecting the propriety of drinking at meals. It is evident from what has been said, that the necessity of drinking must be different under different circumstances; but in general it is best shown by the degree of thirst, and there cannot perhaps be a more erroneous idea than that which induces some people to drink during meals, for the purpose, as they say, of assisting digestion, when they feel no desire for it.

Drinking water can in no other way assist digestion than by affording the proper degree of moisture to the food. If there

be no thirst, we may be assured that it already possesses this degree of moisture, and that any addition to it will only dilute the gastric fluid, and consequently enfeeble its solvent power. I have often observed, that eating too fast causes thirst; the food being swallowed without a due admixture of saliva, the mass formed in the stomach is too dry. It is almost unnecessary to remark, that the liquid taken after food must, both with respect to its quality and the way in which it is added to the food, but imperfectly answer the purposes of that mixed with it during mastication.

The best rules, I believe, which a dyspeptic can follow, are not to yield to every slight sensation of thirst, and when the sensation is considerable, to take but a moderate quantity, and that deliberately; for it is with drinking as with eating, if he swallow with too great rapidity, he will take too much.

Such appear to be the regulations respecting liquids most consistent with the nature of indigestion, when the fluid possesses no other property but that of quenching the thirst. If it possesses other properties, other circumstances demand consideration. Both nutritive articles of diet and stimulants may be received in the liquid form.

I have just had occasion to observe, that the most nutritive fluid alone will neither satisfy the appetite nor afford due nutriment. When we reflect on the facts above stated relating to the manner in which digestion is performed in man and the animals most similar to him, we shall easily perceive why liquids alone are incapable of affording sufficient nutriment. We have seen, that that part of the food which lies next the stomach, having duly undergone the action of the gastric fluid, is moved onward towards the intestine, while that next in succession is in its turn applied to the surface of the stomach, where it excites a further secretion of gastric fluid, undergoes its action, and in like manner is moved onward.

That the motions necessary for these purposes may be readily performed, a certain degree of moisture is necessary; but if the contents of the stomach be wholly fluid, it is evidently impossible that such a process can go on with any degree of precision. The different portions of a mere fluid cannot be so changed and moved on, as to present a constant and regular succession of food, comparatively fresh, to the surface of the stomach; there will not, therefore, be the same stimulus to

excite to a continued secretion of gastric juice, and what is secreted will be too easily diffused through the liquid contents of the stomach, to make the proper impression on any one part: the same must necessarily happen to the more digested part in its passage to the intestine; it must be more or less diffused through the other contents of the stomach; and thus may again come into contact with the stomach, to the exclusion of parts which have not been so; in short, no part will be duly changed. The gastric fluid, being too much diluted for its function, is rather diffused through the contents of the stomach than neutralized by them; hence the appetite is never perfectly allayed, and little nutriment afforded. Thus the effect of liquid food tends to confirm the view of digestion afforded by the facts which have been laid before the reader; and thus it is that when nutritive fluids are mixed with solids, although of a less nutritious quality, in such quantity as to give the former a certain degree of consistency, the mixture is sufficiently nutritious. Strong broth, mixed with bread, or any other solid article of food, is very much so; but it is by no means the form, as appears from what has been said, in which nutriment should be presented to a weak stomach, unless the appetite, or irritability of the stomach, as sometimes happens, be such that solid food alone cannot be taken. The proportion of liquid is too great, if there be much broth in the mixture; and if not, it approaches too much to the nature of a mucilaginous paste, as all sops do, to permit the gastric fluid to pervade it with ease. Thus all kinds of broth are apt to become sour on a weak stomach, and to cause other things to run into fermentation. When liquid nutriment is taken, as soups and broths usually are, before other food, there is the additional objection to it, that it is an unnecessary addition to the meal, for we seldom, on account of it, eat less of other things.

The diet of the dyspeptic should not only be well chosen, but simple. Variety is always an inducement to overload the stomach, and indeed so intermixed are the feelings produced by the calls of hunger, and by the means which please the palate, that, when the desire to eat is constantly renewed by a succession of different kinds of agreeable food, it is impossible to judge when we have received the proper supply.

We have reason to believe that by such means an actual

increase of secretion is produced in the digestive organs, and thus an artificial appetite, if I may use the expression, excited, that is followed by corresponding debility; which, although it may not immediately show itself by symptoms of indigestion, which also is common, at length, in the majority of people, weakens the digestive powers.

With respect to stimulating fluids, the operation of the most innocent of these seems to be chiefly confined to the digestive organs. The various aromatic waters, ginger-tea, &c., seem only to be objectionable in the same way that other kinds of seasoning are, and we shall find that in certain states of indigestion they are useful, in giving temporary tone to the stomach and bowels.

The most pernicious fluids of this class, it is well known, are those which owe their stimulating property to the presence of alcohol. When taken in considerable quantity, they not only, more, perhaps, than any other stimulants, injure the digestive organs; but extend their pernicious effects to other parts of the system, to which they are immediately applied by means of the absorbents.

Like most substances capable of powerfully affecting the animal frame, they possess valuable as well as pernicious qualities; and, were the former of these less eminent than they really are, so general is their use in one form or other; and in most people the habit, which requires their continued use, so fixed; that they seldom can be wholly withdrawn, except in very early life, without doing more harm than good.

All will agree that fermented liquors in every shape are unnecessary to those who are in health, and have never been accustomed to the use of them; and that, had no beverage but water ever been known, however we might feel the want of a stimulus, in many cases, doubtless, the most valuable we possess, some of the most fatal diseases we are subject to would have been less frequent; but these are not the questions before us. Our object is, to inquire what is best for dyspeptics, as we find them in the habits of society which prevail in this country.

As these habits are such, that more or less of such stimulants is necessary to support the usual vigour of the greater number of people, even in health, nothing could be more injudicious than wholly to deprive them of it, when they are already

weakened by disease, unless it could be shown that even a moderate use of them essentially adds to their disease.

As dyspeptics, then, who have been accustomed to the use of alcohol in some shape or other, ought not to be wholly deprived of it, and as, under certain circumstances, it is even a useful remedy, we are here to inquire how far it is found so in indigestion, and how we can best secure its beneficial and avert its pernicious effects.

There appears to be an essential difference in the effects of alcohol, such as it exists in fermented liquors, and after it has been distilled from them. Both have their inconveniences. So apt is the latter to injure the tone of the stomach, that, were it not that it is necessary for the solution of certain medicines, frequently beneficial in indigestion, we might, without hesitation, banish it from the treatment of this disease, with the exception of those cases, in which all kinds of fermented liquors, which have not been distilled, oppress the stomach, and the patient's habits render the use of alcohol in some form indispensable.

In the fermented liquors which have not been distilled, on the other hand, it is often combined with substances of difficult digestion, which are particularly felt by the dyspeptic. This is most remarkably the case with malt liquor, of which even the weakest kinds often oppress the dyspeptic, and the strongest are among the most indigestible articles of diet. The same objection, though in a less degree, exists with respect to the other fermented liquors of this country. Of these cider is the best, provided the acetous fermentation has not commenced in it. Perry usually contains too much mucilage, and some kinds are very oppressive to the stomach, apparently from this cause. The home-made wines are still more objectionable, being still more apt to run into the acetous fermentation.

The form in which alcohol is most beneficial, and in general does least harm, is that of foreign wines. The properties of these are various, and different kinds suit different stomachs. The astringent property of port wine seems to give it a peculiar tonic power; and, if it do not constipate, there is, perhaps, no other wine so well suited to dyspeptics. It should not be drunk till of a certain age, the tartar of new port wine being

offensive to the stomach. Some dyspeptics find it, as well as the other stronger wines, agree better with them, when diluted ; and others find the lighter wines, particularly claret, better ; while, with others, all the lighter wines, and even port wine, are acescent. Even in these cases, however, the effects of the stronger wines are often improved by diluting them. Of this, and many other circumstances in diet, each individual must judge for himself, as there is no rule of general application.

Many stomachs seem to feel the bad effects of the distilled spirits, which, it is said, are added to the stronger wines ; for even the most objectionable of all the fermented liquors, which have not been distilled, appears to be less pernicious than any of those which have undergone this process. I have known dyspeptics so sensible to the bad effects of the latter, that they have felt an increase of debility for several days after drinking a single glass of spirits and water. This does not arise from its oppressing the stomach, it even for the time assists digestion, and that, if the quantity taken be not too great, to a considerable degree ; a property indeed which belongs more or less to all fermented liquors, which do not greatly oppress the stomach, though not in the same degree to those which have not been distilled. It is this unnatural excitement, caused by distilled spirits, that seems to do harm. It is followed by a corresponding debility ; and whatever be the change induced by distillation, there are no facts, I believe, better ascertained, than that the same quantity of alcohol in the form of distilled spirits, although equally diluted, both by its immediate operation gives more temporary assistance to the stomach, and by its secondary effects, hurts it more, than in that of any fermented liquor which has not been distilled.

It is thus that many dyspeptics, whose digestion is disordered by all kinds of wine, can drink diluted spirits. But it is impossible by any addition to make their permanent effects similar to those of wine. Those addicted to wine seem often to be destroyed by excess of nutriment. They become full, often ruddy, at least, for a certain time, even robust, and not unfrequently die of sanguineous apoplexy. Those addicted to spirits, on the contrary, generally become pale, often emaciated, and more or less paralytic ; and although both are subject to debility of stomach, obstructed liver, and dropsical

affections; the latter soonest fall into those diseases, and in them they make the most rapid progress.

A very moderate use of wine can hardly be said to be injurious; we see those who use it moderately live as long, and enjoy as good health, as those who wholly abstain from it; and to some constitutions, independently of the effects of habit, it may be useful. I believe neither of these observations apply to distilled spirits, although, when the stomach has been greatly weakened by excess, so that it cannot digest any fermented liquor which has not been distilled, the effects of a moderate use of diluted spirits is often less injurious than the total collapse of the system which ensues on wholly withdrawing the accustomed stimulant.

The best thing to be done in such cases is to give no more than is necessary, and that in the most diluted form which is consistent with the debilitated state of the habit. The usual additions of lemon and sugar, which are supposed by many to bring the spirit into something like its state previous to distillation, according to my experience, only increase the evil, by adding to the hurtful stimulant articles of difficult digestion, without at all ameliorating its properties. When it is necessary to use distilled spirits, I have found it the best plan to let it be as pure as possible, and mix it with nothing but water. I have known more than one instance in which the stomach was even sensible to the difference between coloured and colourless brandy.

Tea and coffee are sometimes injurious in another way; they possess a narcotic power, which, we have seen, when considerable, is capable of producing indigestion. By many they are regarded as a fruitful cause of this disease; but their effects on the whole have, perhaps, been over-rated. Green tea, and a very strong infusion of black tea or coffee, are injurious to many stomachs. I have repeatedly seen severe fits of indigestion induced by them, always characterized by a greater than usual degree of nervous affection. To many, however, even these, and to most people, a moderately strong infusion of black tea and coffee, seem to be innocent. They produce no present bad effects, and, where this is the case, I have never been able to perceive any proof of their continued use doing harm. It is remarkable that their peculiarly re-

freshing and sedative effect is generally, in the first instance, felt even by those with whom they most disagree. If drunk very hot, they, of course, produce the effects of other hot fluids, which we are presently to consider.

It is by no means a fair inference, that what produces very injurious consequences in some, must do more or less harm in all. We frequently see articles of diet, and still more frequently medicines, which cannot be borne by one stomach, perfectly innocent to another.

The tendency of tea and coffee to prevent sleep in many people, for even this effect is by no means universal, must be injurious as far as the want of sleep is so. It is generally in those in whom they produce most of this effect, that their other injurious effects are most apt to appear.

There has been some difference of opinion respecting the proper temperature of the drink of dyspeptics. Some, from the present relief obtained from fluids drunk very warm, have recommended a high temperature; but the relief thus obtained is, like that obtained from distilled spirits, generally, although by no means in the same degree, compensated by subsequent debility. When fluids, of the usual temperature of the air, are too cold for a weak stomach, which is frequently the case, there is no objection to raising them to any degree that does not exceed that of the body; although, when the stomach bears it well, fluids of the common temperature seem rather to have a tonic effect in indigestion. A very low temperature is objectionable. I have already had occasion to observe that fits of indigestion may be induced in weak stomachs by iced fluids.

The due repetition of our meals also deserves particular attention.

It is evident, from what has been said of the progress of digestion, that a considerable time must elapse after a tolerably full meal, before the more central parts of the food undergo the action of the gastric fluid; but, as we are not prompted to eat, till there is some uncombined gastric fluid in the stomach, it is evident, that it is the intention of nature that we should abstain till some time after all the food already taken has undergone the action of this fluid. The accumulating gastric fluid having

then no more undigested food presented to it, begins so to affect the stomach as to occasion the sensation of hunger. The recurrence of this sensation therefore is the proper indication that a due time has elapsed since the last meal.

Now this will be different under different circumstances, so that it is impossible to lay down any rule of general application; but it can never be very soon after an ordinary meal, except where the digestion is more rapid than natural, which sometimes happens. The patient must be careful to distinguish between a real appetite, and a desire to eat what is agreeable, a mistake by which we often see the stomach oppressed. On the other hand, it is injurious to a weak stomach long to bear the calls of hunger.

It has appeared to me that, with the generality of dyspeptics, to take three moderate meals in the twenty-four hours is the best rule. A few, particularly those who are much troubled with a sense of depression and sinking, find four meals better. The last meal should always be taken a little before bed-time, and should never, if the symptoms of the second stage have in any degree supervened, consist of animal food. Even late dinners are particularly injurious in this stage. The dyspeptic should eat nothing in the intervals of these meals. There is no greater mistake than that he should constantly be taking something. This disturbs the natural process, and entirely prevents the recurrence of appetite, a certain degree of which is a wholesome stimulant. The stomach, by this constant eating, becoming more and more debilitated, and every part by sympathy partaking of the debility, the patient wholly misapprehends the cause; and with a view to increase his strength, still increases the frequency of his meals, till he hardly passes a couple of hours without eating. By such a practice, pursued for years, I have repeatedly seen debility of the stomach and a morbid irritability of the whole system established.

It is not, however, to be overlooked, that there are cases of urgent debility, both in this and other diseases, in which it is for the time necessary that the patient should take little and often. Sometimes the stomach can bear so little food at one time, that were the usual intervals of meals observed, due nutriment would not be received. But it is not sufficiently attended to, that in such states, in proportion as the quantity

of nutriment which the stomach is capable of receiving is lessened, the waste is lessened at the same time. The languor of the digestive organs is communicated to other parts of the system, and, if the organs of supply are inactive, those of waste are affected in a similar way. A due attention to this fact would often prevent the friends of the invalid from urging him to take food against the appetite, which seldom answers any other purpose but that of oppressing the stomach. When it is necessary to eat very often, every care should be taken, by recurring, as soon as possible, to a better plan of diet, to prevent the habit of very frequent eating being formed.

Among the other evils of this practice, an artificial want arises, and if the patient is not continually taking food, he feels a sense of sinking, which persuades him that its constant reception is necessary to his existence. Such patients can only be restored to regular meals by very gradually increasing the intervals of eating. An argument is adduced from the general good condition of cooks, for eating little and very often; but it is forgotten, that a healthy stomach and robust frame will bear many irregularities, which overwhelm a less healthy or more feeble one. We might as well adduce the fact of healthy people being most nourished by oily food, as an argument for feeding the dyspeptic with butter and fat. No doubt, by this constant eating, a great deal of food may be taken, and a strong and healthy stomach, notwithstanding the way in which it is taken, may digest it; but we are here inquiring into the means of best assisting a weak stomach.

I have dwelt the longer on this and other similar points, because I have found them essential to the proper treatment of the dyspeptic; and like the process of digestion itself, they have not perhaps obtained all the attention they deserve. The study of the two subjects, indeed, must go hand in hand; without a correct knowledge of the healthy function, it is evidently impossible to perceive the principles on which this part of the treatment of its deviations should be founded.

In the foregoing observations on diet, the attention has been chiefly confined to its effects on the stomach; but its influence on the bowels of the dyspeptic ought not to be overlooked. Indigestion, we have seen, is generally attended with languid

bowels ; and, as far as the stomach admits of it, it is proper to make the diet such, as tends to counteract this state of them. A vegetable diet is less astringent than one composed chiefly of animal food, and fresh vegetables are more aperient than bread. But this must not be carried too far ; it is better to take aperient medicines, than disorder the stomach by a diet of difficult digestion. I have in several instances seen advantage from eating household bread, mixed with a certain proportion of rice, previously softened by boiling. This mixture, contrary to what might be expected, renders the bread aperient ; but it also, in general, renders it more difficult of digestion. It is also, for the most part, rendered more aperient by allowing part of the bran to remain in the flour ; but when this is done, the bread is more inclined to remain moist, and consequently to form a paste in chewing, which renders it less digestible.

When there is much irritation of the bowels, mucilaginous fluids, gruel, sago, &c. in such quantity as does not oppress the stomach, are useful. Even butter and fat are occasionally useful in this way ; but, in general, considerable quantities of mucilaginous fluids so disorder digestion in a weak stomach, as more than compensates for their effects in the bowels ; and not unfrequently the disorder they produce is such, that the contents of the bowels themselves become of a more irritating nature than they were. I have known many dyspeptics, in whom large quantities of such fluids, and still more the use of butter, always had this effect.

When diarrhœa seems rather to arise from a degree of relaxation of the bowels than from the nature of their contents, it is proper to use articles of an astringent kind, such as rice seasoned with cinnamon. But it is a great error, in the treatment of indigestion, immediately to check diarrhœa, for it generally arises from irritating matter, the retention of which is injurious.

Upon the whole, it may be observed, that the diet which agrees best with the stomach is generally found best for the bowels also ; their disorders in this disease, if we except a degree of languor, generally arising from the vitiated secretions which attend disorders of the former.

*Of Exercise and Change of Air in Indigestion.*

THE exercise both of mind and body demands particular attention in the dyspeptic.

The different kinds of bodily exercise may be arranged under three heads;—that in which the body is moved by its own powers; that in which it is moved by other powers, as in the various modes of gestation; and that in which the circulation is promoted without moving the body, by friction, for example, or merely by pressure.

The dyspeptic may be so weak, that friction is the only kind of exercise which he can bear without fatigue. Wherever the strength is much reduced, indeed, although a little of some rougher exercise may be borne, friction is always useful. It is the principal exercise among the higher rank of some Asiatic nations, and was used both by the Greeks and Romans after they became luxurious. It would not be proper in indigestion to confine the friction to the abdomen, when it is the only mode of exercise, although in such cases it should be carefully applied to this part. To dyspeptics in general, whatever be their other modes of exercise, friction of the abdomen is always useful, particularly of the region of the stomach, liver, and first intestines.

Mere pressure is a mode of exercise inferior to friction; but, if generally applied to the limbs in an interrupted manner, from the valvular structure of the veins, it has a considerable effect in promoting the circulation.

As the total want of exercise is not more pernicious than that which occasions fatigue, and no exercise is very beneficial which cannot be continued for a considerable time, the different kinds of gestation, even when the patient possesses a moderate degree of strength, are often found preferable to those exercises in which the body is moved by its own powers.

The gentlest kind of gestation is sailing, which is serviceable in almost all cases of debility, and has been found particularly so in debility of the stomach and bowels.

Next to sailing, the gentlest exercise in common use is the motion of a carriage: but in such climates as our own, unless the patient has been accustomed to an open carriage, he must either be confined to a close one, or run the risk of taking cold.

As substitutes for a carriage, but inferior to it, swings and spring chairs are used.

None of these modes of exercise is equal to horseback, when the patient is strong enough not to be soon fatigued by it. From the stimulus given to the alimentary canal by the shaking in riding, it appears to be particularly well adapted to indigestion; and every physician has seen instances of this disease, in which it has been more beneficial than any other mode of exercise.

Any rough exercise, however, particularly riding on horseback, soon after meals, disturbs the stomach. If the reader will reflect on what has been said of the process of digestion, the cause of this will readily appear. We have seen that, in healthy digestion, no admixture of the new food with that which may yet remain in the stomach from the last meal, and which, if due time have been afforded, has already undergone the action of the gastric fluid, nor indeed of the different parts of the new food, ever takes place. We must, therefore, infer, that any such admixture is unfavourable to this process; and it is evident, from the way in which digestion is performed, that, did this happen, some part of the food would again be presented to the surface of the stomach, after it had undergone the digestive process; and, consequently, a corresponding portion of undigested food prevented from approaching it in due time.

The mixing of the different parts of the food by any jolting exercise will be most apt to take place in the dyspeptic. If we fill a closed vessel, either with solid or fluid contents, we shall find that but little relative change of place will happen among their different parts by shaking the vessel. But if, instead of these contents wholly filling the vessel, any space be occupied by air, their relative situation will be readily disturbed. Now, the stomach always, more or less firmly, embraces its contents; but, in indigestion, air is generally extricated from the food, and we have reason to believe, indeed, is often secreted by the surface both of the stomach and bowels, and thus room is given for a ready change in the relative position of their contents. The dyspeptic is often warned against any jolting exercise after meals, by the uneasiness it occasions. It is a good general rule, therefore, for him to avoid exercise of all kinds

for an hour and a half after eating. This affords an additional reason for not eating too often. We still find the dictates of nature pointing out what is best ; for all animals are inclined to repose, and even to sleep, after eating.

Walking, when it can be borne for an hour or two without fatigue, is, of all exercises, the best. It is that which nature intends for us. There is no other accompanied with such a uniform and regular action of the muscles and joints ; and from the valvular structure of the veins of the extremities, it is better fitted than any other to promote the circulation, and consequently all the functions of the system. It is also the most agreeable mode of exercise. Our desire for it, when it has been long withheld, becomes extreme.

But in indigestion, from the peculiar effect on the abdominal viscera of riding on horseback, it is generally of service to combine it with this exercise. I have known some dyspeptics, however, to whom horseback was always more or less irksome, when it occasioned any degree of shaking. To such, the slowest riding alone can be useful, and that only when they are unable to walk for a sufficient length of time, and when the weather admits of such gentle exercise without a risk of being chilled, to which we have seen they are peculiarly liable.

Whatever be the mode of exercise, it should be taken as much as possible in the open air. No exercise within doors is equally beneficial.

Those exercises in the open air, in which the bodily exercise is combined with a moderate and pleasurable exercise of mind, particularly gardening, are well adapted to this disease, provided the patient can avoid fatigue, which is not always easily done when the mind is occupied.

A proper exercise of the mind, indeed, is almost of as much consequence to the dyspeptic as that of the body. When the former is languid and listless, the latter is generally ill at ease. This state of mind is more or less counteracted by a due degree of bodily exercise, but the occupation of the mind itself is necessary to its cure.

The maxims, by which the exercise of the body is regulated, are applicable to that of the mind. The great rule is, to exercise without fatiguing it. Any study which fatigues is injurious, and a mind wholly unoccupied is no less so. When

the debility is considerable, the mind should be occupied by amusement alone, and even those amusements which greatly interest the feelings, or occasion any considerable effort of mind, are hurtful. When, on the other hand, the patient has recovered a considerable degree of strength, a moderate attention even to business is serviceable. However varied our occupations, if they tend only to present gratification, they soon become insipid. The mind must have something in view, some plan of increasing its enjoyments, to interest it agreeably for any length of time. There are few things of greater advantage than the conversation of friends, who present to the patient the fairest side of his prospects.

The time of day, at which either the mind or body is exercised, is also a matter of importance. Towards evening every kind of exertion becomes irksome, and consequently hurtful. In the debilitated, a degree of fever, or something resembling it, probably the consequence of the unavoidable irritations of the day, comes on at this time, which is only to be relieved by repose: going early to bed, therefore, is of great consequence to them. It seems to be for the same reason that animal food, which increases any feverish tendency, is hurtful at a late hour.

Exposure to the night air appears to be more pernicious than can easily be explained. I am inclined to ascribe its effects to the damp, which prevails in the early part of the night from the condensation of the watery vapour raised during the day, being applied to the skin at a time when, from the state just mentioned, its function is most apt to fail. In sultry climates, where the evening dews are heavy, the effects of the night air are often fatal, even to those in health. It is well known, both in the East and West Indies, that people are often attacked with agues, from passing a single night abroad in the woods, where the vapour is most confined. Of the baneful effects of the night air at Batavia, Dr. Lind relates a striking proof in his account of the fevers of India:—"During the sickly season, a boat belonging to the Medway man-of-war, which attended on shore every night to bring fresh provisions, was three times successively manned, not one of her crews having survived that service."

The bad effects of the night air, even of this country, to in-

valids, I had often remarked, before I began to consider to what it might be ascribed. Whatever may be said of the explanation, of the fact I have no doubt. It may be observed, that the effects experienced from the night air by dyspeptics, are similar to those produced on them by a damp air from other causes.

It is chiefly to the greater dampness of the air of large towns, I believe, that we should ascribe their often disagreeing with dyspeptics. Dr. Hutton has shown, that when two portions of air, of different temperatures, saturated with water, are mixed, the mean temperature will not enable them to hold in solution the same quantity of water. I have, from an eminence, observed a cold wind, highly charged with moisture, in passing over a great extent of country, which contained several small towns, occasion a deposition of moisture wherever it mixed with the air of the towns; so that from each of them a streak of mist extended in the direction of the wind, the air everywhere else remaining perfectly clear. To the same cause we must ascribe the thick fogs of London, which is generally some degrees above the temperature of the country. They occur when the air is most charged with moisture, and chiefly in the coldest weather, when the number of fires being greatest, there is the greatest difference of temperature between the air of the country and that of the metropolis.

A damp air feels colder than a dry one of the same temperature, not only because it abstracts the heat of our bodies more rapidly, but because it tends to debilitate the functions of the nerves of the surface, one of the principal functions of the nerves being to preserve the due temperature.

Although it is of consequence for the debilitated to go early to bed, there are few things more hurtful to them than remaining in it too long. After the degree of strength, of which the state of the system is capable, is restored by sleep, any longer continuance in bed, unless the debility be such as to render the mere effort of sitting up too much, tends only to relax. Getting up an hour or two earlier often gives a degree of vigour which nothing else can procure. I have known people whose feet constantly became cold and damp if they remained in bed a few hours longer than usual. For those who are not much debilitated, and sleep well, the best rule is to

get out of bed soon after awaking in the morning. This, at first, may be too early, for the debilitated require more sleep than the healthy; but rising early will gradually prolong the sleep on the succeeding night, till the quantity which the patient enjoys is equal to his demand for it.

Lying late is not only hurtful by the relaxation it occasions, but also by occupying the time of the day at which exercise is most beneficial.

If the dyspeptic be much debilitated, he should take his first meal as soon as he is dressed. He will often find himself hurt, and always less benefited by exercise, either of mind or body, with the stomach and upper bowels as empty as they usually are in the morning.

When the debility is less, he will frequently experience benefit from a walk or ride before breakfast. This observation is particularly applicable to those in whom indigestion has produced too great a determination of blood to the head, which is, for the time, increased by the recumbent posture during the night.

We are most vigorous when the first process of digestion is so far advanced, that the vessels which receive the nutriment from the intestines are pouring it into the blood; and then it is that a free circulation is most useful for mixing the new juices with this fluid, and promoting their passage through the lungs, where they are perfected into blood.

Some light and agreeable occupation of the mind, with perfect rest of body, is best for an hour and a half after breakfast. From this period to that of the second meal, which should be about the middle hour between breakfast and bed-time, is the proper time for all the more powerful exercises either of mind or body. The corresponding interval between the second and third meal is better spent in the gentler employments of both; and after the last meal, which should be light, and taken about nine o'clock, the invalid cannot go to bed too soon.

The objection to going to bed after too full a meal is, that the sleep will be disturbed, and consequently less refreshing. Going to bed immediately, even after a light meal, in those unaccustomed to it, will have some degree of this effect at first, but this inconvenience will soon cease. However artificial our habits may be, the system is soon reconciled to a return to what

is natural. When four meals in the day are necessary, the interval between the first and the last should be divided into three, instead of two equal parts.

Under all circumstances, of course, in regulating both diet and exercise, attention must be paid to the age and habits of the patient. It is seldom proper all at once to attempt the correction of the most injurious habits; the change should be made with caution and judgment. This is particularly the case with respect to the use of fermented liquors and active exercise, because there are no means that more essentially influence the constitution; and were we suddenly to withdraw the accustomed stimulants, or urge to efforts beyond the strength, much injury might be done. The more advanced the age, habits are corrected with the greater difficulty, both because all habits are strengthened by continuance, and because the less vigorous the constitution is, it is the less able to bear the change.

At advanced periods of life a change of habits must not only be attempted more cautiously, but it must not be attempted in the same degree. It is to be recollected, that in old age repose is more necessary than at earlier periods, and exertions of every kind less beneficial and more apt to be injurious; and that stimulants are less hurtful, both because old age requires excitements more, and there is less space left for them to produce their pernicious effects. Under all circumstances, however, and at all times of life, the principles which have been laid down must be kept in view.

What is called a change of air, is almost always beneficial in indigestion, and particularly in the advanced stages.

There has been much difference of opinion respecting the cause to which the benefit derived from change of place is to be ascribed. We have reason to believe that it arises from various circumstances, but least of all, in most instances, from mere change of air. It is evident that the air is effectually changed by the wind, and far more rapidly than it can be by any change of place. Yet it is only when the temperature or degree of moisture is changed by the wind, that we can perceive it produce any change in the health, if we except that a certain degree of wind is useful by preventing absolute stillness of the air, which always becomes oppressive when long continued, and that in-

dependently of any impregnation of the air, for it is felt by those who inhabit single houses in the country, as well as by the inhabitants of towns. A free circulation of air is particularly grateful to the feelings, and, as we might from this alone infer, favourable to health.

The truth is, the air is essentially the same in all places. It has been found by correct experiments, that in the closest parts of London and on the top of the Malvern Hills, it possesses the same proportion of the principle which supports animal life, and is itself, indeed, in all respects the same; but it is capable of being variously impregnated. The sense of smell at once informs those from the country, that the air of large towns is less unmixed than that which they have been accustomed to breathe.

All impregnation of this kind must, we should at first view suppose, be more or less injurious, and to a certain degree it may be so; but we have reason to believe, I think, that it is much less so than the occasional greater dampness and consequent chilliness of the air of large towns, produced in the way just pointed out, and the usual greater stillness of the air in them from confinement by the buildings.

If we except moisture, the chief impregnation of the air of the large towns of this country is from smoke, which does not appear to be particularly unwholesome. It has, on the contrary indeed, been supposed to preserve from disease, and has often been employed with this view. The other effluvia of our towns are in too small quantity to produce much impregnation of the external air.

It has just been remarked, that the change of air by the wind seems only to affect the health by the motion of the air it occasions, and by its influencing its temperature and degree of moisture. I am inclined to think that it is merely in these ways, which are doubtless in many cases very important, that change of place, as far as the air is concerned, usually affects us\*.

\* Some have been inclined to doubt whether the air is ever so changed as to produce disease, independently of the presence of contagion and the changes of its temperature and degree of moisture; but there are some well-ascertained facts which it is difficult to explain on any other supposition. We see contagious diseases, particularly the plague, appearing and

But there are many other things in change of place capable of essentially influencing health, of which, I believe, the most powerful is the excitement given by the change itself. How often do we find continual change necessary, the new place being no better than the old, as soon as the novelty is worn away.

To the mere exercise of body occasioned by the travelling, or to which a new situation naturally excites, much may often be ascribed; but we must look to the occupation and cheerfulness of mind occasioned by the change for its chief effects. The feelings of sickness on the one hand, like all other feelings, are soon associated with every thing around us; and on the other, the mind, if not forcibly abstracted, fixes intensely on any object, which for a long time chiefly occupies it. In long-continued sickness, we want something to break that association, and something to divide our attention. What can so powerfully produce these effects as a total change of place? The poor, in some parts of this country, who cannot afford to send their children to a distance in the decline of hooping-cough, in which change of place is so powerful a remedy, confine them daily for a certain time close to the machinery of a mill, and this often answers the purpose as well.

Let me add, those who ascribe to fancy all diseases which may be cured by change, know little of the nature of disease or of the laws of the animal economy. Will they ascribe the hooping-cough to fancy, or eruptions and sores of the surface, pains and stiffness of the joints, and a thousand other ailments, which are often cured by change alone? We have seen how various the diseases which depend on affections of the digestive organs are; and how much these affections are influenced by the state of the mind, which is very nearly as much the subject of external circumstances as the body.

SUCH are the means of preventing the re-application of the causes of indigestion most apt to arise from the disease itself.

declining in different parts of a country, perhaps hundreds of miles distant from each other, at the same time and without any evident cause, which it would be difficult to account for by any of the known properties of contagion. I have elsewhere had occasion to consider this subject at some length.—*Treatise on simple and eruptive Fevers*, p. 158, *et seq.*, fourth edition.

Other causes belonging to this head will occur to the mind of every one conversant with it. Frequent vomiting, diarrhœa, and fits of constipation, are among the chief of these. It is almost unnecessary to say that they must be corrected as soon as the circumstances of the case admit of it. The means proper for this purpose will appear in considering what may be called the medicinal part of the treatment.

*Of the Medicinal Treatment in the First Stage of Indigestion.*

It appears, from what has been said of the nature of the first stage of indigestion, that it arises from the debility of the nervous power and muscular fibres of the stomach and bowels. While we are, by a proper regulation of diet and exercise, endeavouring to prevent every cause which may increase their debility, it is necessary, by the aids which medicine affords, to endeavour more directly to restore their vigour.

The medicinal treatment of this stage may be divided into that indicated while the disease is confined to the stomach and bowels, and that which becomes necessary in consequence of its having spread to other parts.

But besides the means which alone deserve the name of curative, others, to be regarded as preparatory, must occasionally be employed. To give the curative plan the best chance of success, it is not only necessary to remove the remote causes, and prevent their re-application; but, as far as we can, to remove the more immediate effects of these causes, and thus bring the digestive organs into the circumstances most favourable to the operation of that plan.

*Of the Preparative Means.*

WHEN we are consulted by those labouring under indigestion, we generally find the stomach and bowels loaded. It is necessary, in the first place, to relieve them from some part of this load, and, as far as we can, to correct the properties of that which remains. On this account we frequently find it advisable to commence the treatment by an emetic, followed by some mild aperient. It should be our endeavour, by an attention to the proper rules of diet, to prevent the necessity of repeating the former of these, and the latter, we shall find, only makes part of the general plan, as far as it is necessary

for the regular and free action of the bowels, more active aperients being necessary only when greater than usual accumulations occur.

An emetic, in the early stages of the disease, seems sometimes beneficial by the excitement, as well as the evacuation, it occasions. Its frequent repetition, however, is injurious. Frequent vomiting, we have seen, ranked among the causes of the disease; yet the temporary relief, obtained by emetics, not only often induces the patient to repeat them, but has persuaded some physicians that the cure of the disease may be attempted by them alone.

If the first emetic, however, does not remove it, as sometimes happens, when it is slight, and of recent occurrence, rather deserving the name of disordered stomach than the disease we are considering; its repetition generally does more harm than good. If emetics are repeated at all, it should only be for the purpose of removing urgent symptoms. Their continued use not only occasions a great degree of morbid excitement, but inverts the natural action of the stomach, and frequently of the first intestine also, and consequently tends to debilitate both, and break the habit of their natural functions.

When it appears that offensive matter still exists in the stomach and bowels, after the operation of the emetic and aperient, which may be known by a furred tongue and disagreeable taste, a sense of oppression and distention, and by eructation of wind and ill-digested food, or of an acid matter, which is sometimes so acrid as almost to excoriate the fauces; we must, by the use of correctives, more directly alter the morbid properties of their contents, and at the same time, by gentle stimulants, particularly the distilled waters, occasionally mixed with a small proportion of some aromatic tincture, endeavour to excite these organs to a better secretion.

When the eructations are acid, the alkalis, magnesia, lime-water, and prepared chalk, are the best correctives\*. If the foregoing symptoms are attended with much debility, a cold surface, and sense of sinking, carbonate of ammonia, or *liquor*

\* I may here observe that the pure alkalis, both from the extrication of air being apt to oppress, and because they more readily combine with the acid of the first passages, are sometimes found better correctors of acidity than their carbonates.

*ammonia*, in small doses, is the best. When the bowels are too languid, magnesia, which forms an aperient salt with the acid of the first passages, may be used; and when diarrhœa prevails, lime-water, and the prepared chalk, which tend to constipate. In this case also, combining the chalk with some mucilaginous substance, which defends the surface of the stomach and bowels, as in the *mistura cretæ*, is generally of use. In other cases the fixed alkalis, particularly soda, from its greater power, is the best antacid.

Although morbid acidity may be lessened, it cannot be wholly prevented by a diet consisting chiefly of animal food; and I have repeatedly had occasion to observe, which we should not *à priori* expect, that when a person is wholly confined to animal food, the contents of the stomach and the breath become very acid as soon as he begins to feel disgusted with it.

As the pains which arise from irritating matter in the stomach and bowels proceed either directly from irritation of their surface, or from spasms excited by the irritation; they are generally allayed by the means just pointed out. In spasm, which is distinguished by the pain being unaccompanied by the symptoms which indicate inflammation, the aromatic tinctures may occasionally be used in larger doses than would be proper in their habitual employment. I shall presently have occasion to speak of the effect of heat in relieving this pain.

If the foregoing means fail, an opiate must be given, care being taken, by the subsequent exhibition of an aperient, to counteract its constipating tendency. The exhibition of the aperient with the opiate, for the most part, tends to prevent the effect of both.

Spasm of a more permanent nature seems sometimes to attend and oppose a powerful obstacle to the action of the bowels. The combination of an opiate with the aperient seems then often to promote its operation. The repetition of the opiate, under such circumstances, however, requires circumspection. It may, by counteracting the peristaltic motion of the intestines, prove a more obstinate cause of constipation than the spasm which it removes.

When diarrhœa, excited by the irritating contents of the

bowels, continues after we have reason to believe that its cause has been expelled, mucilage of acacia, with small doses of opium, or if these alone do not succeed, combined with astringents and prepared chalk, are the proper means.

When vomiting is obstinate, it is often allayed by the saline draught taken in a state of effervescence, or a mixture of sulphuric acid, conserve of roses, and peppermint-water, carefully strained. If these fail, the most effectual means, according to my experience, are a pill, composed of opium and camphor, and blistering the region of the stomach\*.

Such are the means, by a judicious employment of which the stomach and bowels are brought, as nearly as their debilitated functions admit of, into the natural state; the more nearly this can be done, the better is the chance of relief from the means we are now to consider, namely, those which tend more directly to restore tone to these organs.

*Of the Treatment when the Disease is confined to the Stomach and Bowels.*

WE have seen, that although the causes of indigestion seem, some to act on the muscular fibres of the stomach, and some on its nerves, these parts are so connected in their functions, that whatever debilitates the one, in a greater or less degree, necessarily affects the other. We shall find that a similar observation applies to the means of relief. Whatever tends to restore a healthy nervous power to the stomach, tends to form the food into that substance which is best fitted to excite the muscular fibres of this organ; and whatever excites the natural action of these fibres, tends to relieve the nerves from their load, and

\* When, in the second stage of indigestion, along with the vomiting, there is considerable tenderness on pressure in the epigastrium, the means which take off the inflammatory action, particularly loss of blood from the part, with subsequent blistering, are the most effectual means.

In the affection of the stomach, called the water-brash, there is a frequent rejection, rather resembling eructation than vomiting, of a watery fluid from the stomach. I cannot help agreeing in opinion with Dr. Cullen, that this is a peculiar affection of the stomach, not depending on the state of that organ which produces the disease we are considering. It is not necessarily accompanied by the usual symptoms of indigestion. In this affection I have found a combination of kino with small doses of opium very effectual.

in the most favourable way to bring into contact with their extremities the food on which, through the intervention of the gastric juice, their powers are to be exerted.

Although some of the remedies seem to operate more in the one of these ways than in the other, it will be better, as I wish to avoid nice distinctions, to include the whole under one head, in an inquiry respecting the use of tonic remedies in this disease ; and I shall attempt no other division than the simple one of the means which act directly on the stomach and bowels, and those which influence them through other parts.

The former may be divided into two classes, those which tend to allay pain and irritation, or for the time to excite the particular function of the debilitated organs ; and those which seem to act less by any immediate effect than by bestowing on these organs some degree of permanent vigour.

The medicines of the one class have been termed stimulants and anodynes. The most powerful of the other consist of bitters, astringents, and those medicines which tend to support a due activity of the bowels.

I HAVE already had occasion to observe, that simple distilled spirits, and still more the aromatic tinctures, tend for the time to promote the action of the stomach, and to warn against too free a use of them ; because the increased vigour thus procured, especially if they have been frequently repeated, is generally succeeded by corresponding debility. From very small doses of such medicines, however, particularly when combined with those whose effects are more permanent, advantage on the whole arises. We find that bitters and astringents not only produce their good effects more speedily, but, for the most part, more permanently also, if combined with small doses of those medicines, which are more purely stimulant ; and, indeed, the assistance of the latter seems often necessary to enable the stomach to bear the former without oppression.

Thus it has become an universal practice to combine a small quantity of distilled spirits and aromatics, with other stomachic medicines. The quantity of distilled spirits in such mixtures should always be small,—a twelfth, at most an eighth, of the whole. The choice of the aromatic is of less consequence ; the

properties of all are similar. Some suit the stomach and the taste of individuals better than others. There is, upon the whole, however, some difference in their properties. Ginger may be used when cardamoms would heat too much, and cardamoms will relieve flatulence and spasmodic pains, when ginger would fail.

Similar in their operation to this class of medicines are, ammonia and its carbonate, which have not, perhaps, obtained all the attention they deserve in the disease before us. They are more apt to heat than aromatics, and, in the same proportion, more beneficial in that languor and coldness which are often such prominent features of indigestion. I have found them decidedly serviceable when aromatics had failed. They are best adapted to those cases where a continuance of the disease has produced an unusually languid circulation, without much tenderness of the epigastrium, hard pulse, or burning in the hands or feet at night. I have, however, found them of great use, as we shall find in speaking of the treatment of the second stage, even where these symptoms prevail in some measure, when the temperature of the surface, and particularly of the hands and feet, was generally below the healthy degree; and have even with great advantage combined their use with the local means which counteract the inflammatory tendency. I shall speak of this medicine more at length in treating of the more protracted forms of the disease, in which it is more generally useful.

Camphor possesses some of the properties of ammonia in a slighter degree; and its sedative property renders the *mistura camphoræ* a good vehicle for other medicines.

Among the means of temporary relief in indigestion, very warm water holds a higher place, perhaps, than is generally supposed. To its frequent use we have seen there are the same objections as to other powerful stimulants. It deserves mentioning, that a considerable degree of heat, I mean nearly as much as the patient can bear without complaint, applied externally to the region of the stomach, and continued for a sufficient length of time, is more effectual in relieving that kind of pain of the stomach which most frequently attends indigestion, and which appears to arise from spasm of the muscular coat of the stomach and bowels, than any application of heat we can make internally, which arises probably from our being en-

abled to apply a great degree of heat in this way for a longer time. The same pain is also frequently relieved by heat applied to the feet.

Opium belongs to the head of remedies employed for temporary relief. Large doses of this medicine have no place in the treatment of indigestion, except for the purpose of relieving severe pain. Very small doses, however, one or two minims of tincture of opium, for example, repeated two or three times a day, often prove highly serviceable in allaying morbid irritation, and thus promoting the healthy functions. The constipating effect of such doses is generally easily counteracted, and sometimes indeed they have very little of this effect. I have found small doses of extract of poppies used for this purpose very beneficial.

The *pulvis ipecacuanhæ compositus* is perhaps, in the greater number of cases, the most beneficial form in which small doses of opium can be given in indigestion. From one to three grains, given every six or eight hours, appear to have a peculiar effect in allaying the irritations attending this disease, which probably arises from its action on the skin. It appears to be best adapted to those cases in which the patient is more inclined to restlessness, than languor. It is better from time to time to discontinue and renew its use, than to exhibit it for a great length of time, without interruption; which, even when the dose is very small, is apt to occasion some confusion or other uneasiness of the head. When the bowels are very languid, *hyosciamus* is the best opiate. In some constitutions it acts as an aperient.

The effect of opiates in indigestion explains an observation sometimes made by dyspeptics, that they find their dinner digested with less flatulence and acidity, when they go to sleep after it. The composure produced by sleep, in some degree, answers the purpose of the opiate. In many dyspeptics a moderate dose of opium, taken after dinner, gives more relief, and, for the time, more effectually promotes digestion, than any other means. It is almost unnecessary to add, that the habit of employing it for this purpose is very objectionable. It is probably on account of its anodyne quality, that lettuce, as I have had occasion to observe above, appears to be less indigestible than other raw vegetables.

In considering the causes of indigestion, we have seen how readily the disease is increased by every thing which occasions morbid irritation of the nerves of the stomach. It is, in a great degree, in this way that the undigested contents of a weak stomach aggravate the symptoms. By lessening the sensibility of the nerves, and thus allaying that irritation, an opiate seems to check the progress of indigestion, as well as to render us less sensible to the irritation it occasions.

The medicines called nervous are also often useful in allaying irritation, especially when it chiefly affects parts at a distance from the stomach. Myrrh, camphor, castor, and valerian, I have found most beneficial, except when the disease inclines to hysteria, and then a combination of some of these, and asafœtida, is a means of temporary relief, second, perhaps, to none but ether, which approaches too nearly to the nature of distilled spirits, to admit of its free employment. This class of medicines, and particularly the combination just mentioned, that especially of asafœtida and castor, seldom fail to give relief in palpitation arising from indigestion, where no inflammatory disposition has supervened. They also, in general, give more or less temporary relief to the dyspnœa, which, in some cases, we have found so obstinate a symptom. Of the various medicines of this class, however, those most effectual in some cases are not always found so in others; and when such as are on the whole most successful fail, others often succeed.

But it is of much less consequence to give relief in fits of indigestion than to prevent their recurrence. We are now to inquire how far medicine can assist the due regulation of diet and exercise in effecting this object.

THE small doses of opium which I have just had occasion to mention, are calculated to effect more than temporary relief in indigestion. I have found them of essential use combined with the medicines we are about to consider.

It has already been observed, that of the stimulants whose effect is most permanent, bitters and astringents are those on which we chiefly rely, and that their effect is increased by combining them with small doses of some of the stimulants we have been considering.

Bitters have been long known to possess a power of in-

vigorating the digestive organs. There is a great variety of them, but I believe they may all be divided into simple bitters, and those which, independently of the effect of the bitter, seem to possess a peculiar tonic quality. Of those in common use, camomile, bitter orange-peel, wormwood, and hops, seem to be most free from this quality \*. Calumba possesses it in a greater degree than gentian and cascarilla, and the Peruvian bark in a greater degree than any other. I speak not at present of the astringency of the last, which renders it a medicine of different properties. It is particularly to be observed that this tonic property of bitters, although less immediately powerful, is of a more permanent nature than that of the stimulants which we have been considering; and the latter may often be used for the purpose of occasional relief, when the inflammatory tendency is too great to admit of the more permanent stimulant.

All the foregoing bitters, if we except the bark, which in many cases is oppressive to the stomach, are well suited to the first stage of indigestion; but in proportion as the second stage approaches, we find the less tonic bitters answer better; and in this stage, even the gentian, which, of those that deserve the name of tonic, possesses, perhaps, the least of this property, is often too heating; and the bark in general cannot be borne, even for a few days; while in the early periods of the disease, when it supervenes on debilitated states of the constitution, and the stomach still retains considerable comparative vigour, the bark is often the most beneficial of all bitters. It has by some been almost banished from the treatment of indigestion; but this, I believe, has arisen from its having been employed indiscriminately in all cases and periods of the disease. The sulphate of quinine appears to be its best preparation.

It is remarkable that certain stomachs cannot bear any species of bitter. I know some who constantly suffer from even a few spoonfuls of camomile tea; so that in them we are wholly precluded from the use of this class of medicines.

\* By the tonic quality of bitters, I mean the power by which some of them increase the force of the circulation, and consequently are rendered improper where the inflammatory diathesis prevails. It seems not to be generally known, that this property bears little relation to the quantity of essential oil which they contain.

Many object to the long-continued use of bitters and aromatics. There are strong objections to the long-continued use of every medicine. If it is one of power, it exhausts the strength ; if not, it seems to become wholly inert. When the disease is obstinate, it is better, after a certain degree of relief is obtained, to discontinue such medicines, and, sooner or later, recur to them, as the symptoms may require.

I believe, however, the apprehensions from their long-continued use have chiefly arisen from their effects in gouty cases. It prevents the regular return of this disease, as has been proved by the effects of what was called the Portland Powder, and some other specifics : but it follows, I think, from the facts stated in the last Chapter, that the bad effects which ensue should rather be ascribed to the prevention of the regular gout, than any direct operation of the medicine. The same effects follow when the return of regular fits is prevented merely by applications to the joints, which, independently of this consequence, can have no effect on the general health.

Astringents are less generally adapted to cases of indigestion than bitters, on account of their tendency to increase the inactivity of the bowels. Some of them, however, are medicines of such value, that we often find it advisable to employ them, although at the expense of correcting this effect. Nor are they in all cases equally apt to produce it.

All vegetable astringents seem to have more or less tonic effect on the stomach, as well as on other parts of the system ; and to this we must, in some degree, ascribe the good effects of the bark in the cases above pointed out ; but the mineral kingdom affords the most beneficial medicines of this description. Of these, iron deserves the first place. In chlorotic indigestion, combined with stimulants, it is the most powerful medicine we possess, because it is the most powerful in removing the obstruction whence the indigestion by sympathy arises ; so that in this case it belongs rather to the class of remedies which we are next to consider ; but there are few cases of indigestion in which it is not found more or less useful at an early period, if no tendency to the second stage of the disease has shown itself. Its good effects are increased by combining it with bitters and aromatics ; and, in the first stage of indigestion, the carbonate has appeared to me its best preparation,

provided it can be taken in rather large doses, without oppressing the stomach.

Next to iron, the sulphuric acid seems to be the best stomatic astringent, and it may be used in later stages of the disease than iron. It is particularly serviceable in those cases, where sweating attends spontaneously or is too easily induced by exercise; for much tendency to sweating indicates relaxation, not vigour of the skin. It appears from the experiments relating to the circumstances which influence the state of the urine, above referred to, that the saline matter, secreted by the skin, is not so certainly thrown off, even by profuse sweating, as by a free, insensible perspiration.

In the opinion of many, the sulphate of zinc, given in very small doses, also holds a distinguished place among the astringents suited to indigestion, and it is sometimes successful where other tonics fail. It may be given at later periods than iron, but it requires caution; and if its good effects do not soon appear, should be laid aside. It has appeared to me, from repeated trials, that alum possesses considerable power as a tonic in indigestion, and, like the last mentioned, it has little or no heating quality, and has the advantage of being perfectly safe.

Other medicines seem to act on the alimentary canal in a way similar to bitters and astringents. All the mineral acids possess more or less of a tonic power. The subnitrate of bismuth has lately been much celebrated. It seems best adapted to those cases in which there is frequent recurrence of pain referred to the stomach, in the prevention of which it is often very successful.

To enumerate all the medicines which have been employed with a view to restore vigour to the stomach and bowels would be a difficult, and not a very useful task; for few, with the exception of the foregoing, possess much power. The acrid vegetables, particularly horse-radish and mustard-seed, are indicated in the same cases in which ammonia and aromatics are beneficial. Their effect is generally less powerful but more permanent. An infusion of them often forms a good vehicle for the latter medicines.

Sarsaparilla appears to hold a much higher place among the remedies of indigestion than is generally supposed, but it is not

to its early stages that it is best suited. It is in cases, which we shall soon have occasion to consider more particularly, where general languor of the secreting surfaces has become permanent, and the stomach is consequently in some degree relieved, that it is most useful.

It has become common to employ mercury, in some form or other, in all cases of indigestion; but, I believe its use is always injurious in the period of the disease we are now considering; that is, while the derangement is confined to the alimentary canal. I shall have occasion to treat fully of what appears to me the proper use of this medicine in the other periods of the disease. Instances have frequently occurred, in which the disease seemed to be confirmed by its unnecessary and incautious employment. I believe we may say, without hesitation, that it is never to be used at any period for the mere purposes of an aperient.

The proper use of aperients is a subject of great importance at all periods, and in all states of indigestion. In the period under consideration, their object is merely to support a regular action of the bowels, which, as the secretions of the whole canal are inclined to fail, and the stomach and bowels do not discharge their contents so readily as they ought to do, should be rather freer than in health. It often has an excellent effect to combine bitters with gentle aperients in the early stages of the disease. Epsom salts are frequently employed in this way with advantage. If they are too cold, or occasion too watery a discharge, small doses of sulphate of potash and rhubarb often answer better.

Different aperients suit different constitutions. I have found none employed merely for the purpose of supporting a regular action of the bowels, so generally useful as pills composed of ipecacuanha, compound extract of colocynth, and soap, occasionally taken before dinner or at bed-time, with the addition of a little gamboge, when they are not sufficiently active. In many senna has appeared to me a medicine of great value. It seems more directly to promote digestion, at the same time that it excites the bowels; a property also of the pills just mentioned.

With respect to those remedies which act on other parts, and only by sympathy influence the alimentary canal, the most powerful, and, indeed, the only ones which appear to

have much effect, are such as make their impression on the skin and the uterus. I have already had occasion to mention one of the most powerful of the latter means. They consist of such as tend to invigorate the general habit, or stimulate the uterus and the parts with which it sympathizes. For which I must refer to the works on this subject. With respect to the means which make their impression on the skin, the cold bath, where there is considerable general vigour, and spunging the body with salt water, or water and vinegar, especially when this practice is followed by friction of some continuance, often aid other means, and sometimes appear to be powerful remedies; and the warm salt bath in almost all cases where the head is not much affected is beneficial; where there is pain or other symptoms of determination of blood to the head, the shower bath, cold or tepid, according as the patient is more or less vigorous, is generally more successful.

Of friction, in general, I have already had occasion to speak. Among the means we are considering might be ranked blistering the epigastric region, were not so severe a remedy hardly allowable in the earlier periods of the disease, where gentler means generally succeed. Covering the epigastric region with stimulating and anodyne plasters is sometimes of use.

The gastric juice of other animals has been proposed as a remedy in indigestion. If the view which has been taken of this disease be correct, it could answer no other purpose but that of temporary relief. I have known the inspissated bile of the ox used as an aperient in indigestion with good effect. It appears to deserve attention, particularly in the state of the disease we are now to consider.

*Of the Treatment when the Disease has spread further than the Stomach and Bowels.*

It is observed in the first chapter, that, sooner or later after the first symptoms of this disease have shown themselves, the alvine discharge begins to deviate from the healthy state, in different cases, and sometimes in the same case at different times, assuming various appearances. The treatment then becomes more complicated.

When the alvine discharge assumes an unnatural colour, we may be assured that the disease has spread further than the

alimentary canal. The secreting power of the liver, and probably of the pancreas, partakes of it. As these organs pour their secretions into the first intestine, the state of which seems so greatly to influence the symptoms of the different stages of indigestion, they immediately affect the greater part of the canal, and, by sympathy, influence the state of the stomach. The beneficial effect of purgatives in indigestion seems greatly to depend on their assisting the motions of that intestine; and I have, from several cases, had reason to believe that the peculiarly beneficial effects sometimes witnessed from senna in the disease before us, arise from its being well fitted to promote its action. It has appeared more effectually to remove the fulness of the right hypochondrium, when it depends on morbid distention of the duodenum, than any other medicine equally mild in its operation.

The change in the appearance of the alvine discharge, we have seen, occurs at various periods of the disease; in some cases, almost as soon as the symptoms of indigestion begin to attract notice; so that it is difficult to say, except from considering the nature of the remote causes, where the disease originated. It is more common, however, for it to take place after various symptoms of disordered digestion have lasted for some weeks, and the slighter symptoms, we have seen, in some cases, continue for years without any material alteration in the appearance of this discharge.

Of the particular state of the pancreatic fluid, we have no means of judging. The alvine discharge, it appears from what was said above, generally owes its colour to the bile. By the degree of colour, therefore, we may judge of the quantity of bile poured into the intestines, and by its hue, of the state of this fluid. An admixture of blood, when it flows from a high part of the canal, so that it is mixed with the other contents, and has had time to assume a dark colour, sometimes gives to the discharge an appearance similar to that given by certain states of the bile. They may be distinguished, however, by dilution with water; if the change of colour arise from bile, a greenish or yellowish shade will be produced; if from blood, a dark brown one.

Thus, when the appearance of the alvine discharge deviates from that of health, we may generally be assured that, in ad-

dition to the original disease, we have to contend with more or less derangement in the function of the liver.

The principle of the treatment is to combine with the means which tend to restore vigour to the alimentary canal, which we have just been considering, those which correct the action of the liver.

It is generally admitted that we possess no medicine of equal power with mercury in correcting morbid affections of this organ; but it unfortunately happens that its continued use is generally injurious to other organs, and particularly to the stomach and bowels; and the chief object to be kept in view in its employment in this stage of indigestion is, so to manage its exhibition, that it shall produce the desired effect on the liver, with as little injury as possible to other parts of the system.

The first observation which presents itself on the employment of mercury at this period is, that it is not to be so given as to be received into the circulating system. Mercury, when thus introduced, has the property of more or less exciting all the secreting surfaces; but their excitement is supported by it, if the quantity be considerable, at great expense to the constitution, and, when long continued, seldom fails to impair its powers. No practice can be worse than that which unnecessarily risks this effect. In the first stage of indigestion, there is no occasion to change by such means the state of the general habit to which the diseased action has but imperfectly extended, and in which it is still so purely sympathetic, that it immediately disappears as soon as the disease of the central parts is removed; and experience has amply proved, that, in consequence of the sympathy which exists between the liver and alimentary canal, the deranged action of the former can, in this stage of the disease, be corrected by the local effect alone of the mercury on the latter.

Another observation of importance is, that at this period the long-continued use of mercury is seldom necessary. The practice of giving it every second day, or even daily, and almost indiscriminately, in cases of indigestion, for a considerable length of time without attending to the state of the alvine discharge, although its reception into the system be prevented by the regular use of purgatives, is, as far as I can

judge, in opposition to every thing which we know of the nature of the disease, and the effects of this medicine.

What are the effects which we expect from the use of mercury in the first stage of indigestion, after a healthy secretion of bile is restored, which is often effected by two or three doses, sometimes by one? It is true that a recurrence to it is generally necessary, but we should wait till we see whether this necessity be indicated by a return of the morbid state of the bile. The effect of its first exhibition is more or less permanent in different cases, and the most favourable cases, when we have obtained a healthy flow of bile, yield to the other means we have been considering.

In the more obstinate cases, indeed, where the disordered state of the liver constantly recurs at short intervals, it is better for a certain time to give a moderate dose at stated intervals, by which the alimentary canal suffers less, as a smaller quantity is required for the prevention of this state, than for its removal, to say nothing of the injurious effects of the vitiated secretions themselves. But even in such cases, this practice should not be long pursued, without trying from time to time how far the powers of the constitution are sufficient without its aid. By these means we ascertain the extent to which it is necessary to carry the use of the medicine.

The form in which it should be exhibited is also a point of great importance. It ought never, we may safely affirm, in the case before us, to be used externally; for we have no reason to believe, that its application to the skin can materially affect the liver by sympathy; and we generally find, that, when exhibited in this way, it produces little effect on that organ, till the state of the gums shows its presence in the constitution, which, I have just had occasion to observe, is at this period unnecessary.

All that is here wanted is something that may speedily correct the disordered function of the liver. To produce this effect quickly, without being more generally applied to the system than is necessary, mercury must be given internally. The sympathetic effect on the liver, during its passage through the alimentary canal, we have seen, is sufficient for the purpose.

There are two forms in which it is usually given, calomel and blue pill. The former being the most aperient, it is a

good general rule to give it when the bowels are most languid, and the blue pill when they are more easily excited. But this is not the only property in which these preparations differ. The blue pill is generally most oppressive to the stomach; the calomel most irritating to the bowels; although, in some cases, I have seen the former, from its being less aperient, and consequently, for a longer time, hanging about the bowels, if I may use the expression, more irritating than calomel.

For the same reason, small doses of calomel, a quarter, or half a grain, are often more irritating than two or three grains, which more quickly pass off; and the irritation of the bowels is most effectually prevented by taking an aperient draught some hours after the calomel.

From these properties of the two preparations, the reader will readily perceive the circumstances which should influence our choice of them. In the most recent cases, calomel taken at night, and carried off by an active draught in the morning, generally answers best. Here we want only the most transitory action of the medicine.

On the other hand, when the disease has lasted longer, or the first few doses of calomel have failed to produce a permanent flow of healthy bile, we feel the necessity of employing a preparation which may remain some time in the alimentary canal with less irritation than calomel.

Hence the great success which often attends giving four or five grains of the blue pill every second or third night, and carrying it off by some gentle aperient in the morning, as recommended by Mr. Abernethy, particularly in those cases where the affection of the liver has supervened early, and where, consequently, it is the principal cause which supports and aggravates the disease. This observation, it is evident, applies with still greater force, when it is the original disease, and the alimentary canal suffers only by sympathy and the irritation of the vitiated bile. It is always to be recollected, that it is an unhealthy bile alone which renders mercury necessary in the first stage of indigestion, that the time required for correcting it is different in different cases, and that all that is taken after this is injurious.

In some the blue pill is so oppressive, that they cannot take

it even in much smaller doses \*. In them the hydrarg. c. creta sometimes answers better ; or small doses of calomel may be given, and its tendency to irritate corrected by combining it with anodynes.

The most beneficial operation of calomel depends on its purgative property. While, by its peculiar effect on the first passages, it excites a better action of the liver ; by its purgative effect, as well as by that of the draught which its exhibition renders expedient, it tends further to emulge the gall-ducts, and relieve the distended state of the liver.

Its operation then is most wanted where this distention is greatest, which may be known, we have seen, by examination of the region of the liver, and will be least injurious where the strength is most able to bear so considerable a call upon it. When there is little distention of the liver, and the strength is much reduced, the operation of the blue pill is preferable. The relief obtained from it may be less speedy, but it will be more permanent and obtained at less expense to the constitution. Instances frequently occur of the bad effects of not attending to this distinction. What is only a salutary evacuation in one case, is a cause of debility in another.

Where the symptoms are rather obstinate than severe, and where they yield readily, but continually show a tendency to return, covering the parts, to which the tenderness and fulness have extended, with a warm mercurial plaster, often, in the former instance, tends to remove the disease, and in the latter, to prevent its recurrence. I have known such a plaster worn for months, and even years, the symptoms constantly recurring when it was laid aside.

When mercury occasions much irritation of the bowels, its continued use brings on a degree of dysentery. Calomel is most apt to produce this effect. The patient is tormented with griping and tenesmus, and at length passes little more than mucus, often mixed with a small quantity of blood. If, in

\* It is remarkable that the blue pill is so offensive to some constitutions, that I have seen several instances, in which it disordered the secretion of bile, even when it was healthy at the time of its exhibition ; and in such cases, as far as I have observed, the disordered state of the bile continues as long as it is used. This effect is similar to that which we sometimes observe from repeated doses of calomel in children.

such cases, we increase the dose of mercury, in hopes of freer evacuations, we often only increase the evil. Discontinuing its use for a little is the best remedy; and when we find, as sometimes happens in such cases, that on returning to it the same symptoms constantly recur, and cannot be prevented by changing the preparation, or the use of anodynes and mucilages, it must for some time be laid aside.

Many think the hydrargyrum cum creta the best preparation when the bowels are irritable, and in some constitutions this seems to be the case; but in general I have not found its superiority such as I was at first led to expect.

Both because mercury seldom produces much irritation of the bowels, except when its use has been continued for some time, and because this effect is most apt to ensue when the bowels have been long exposed to other causes of irritation; we less frequently have to contend with it in the first stage of indigestion\*.

There are few substitutes for mercury, and none on which much dependence can be placed. The mineral acids are the best. A combination of the muriatic and nitric acids has appeared to me the most successful, whether taken internally or used externally in the way recommended by Dr. Scott.

This class of medicines is otherwise useful, we have seen, in the first stage of indigestion; and if they maintain a due action of the liver, there is no occasion for the use of mercury. They seldom, however, have this effect for any length of time when its action has been greatly disordered; and they are much less capable than mercury of quickly restoring it, and hardly at all of suddenly emulging the biliary ducts, the effects which we look for from mercury in the first stage of indigestion. I shall have occasion to make some observations on the use of the mineral acids, in speaking of the treatment of the second stage.

In some cases we shall find that the dandelion assists the effects of mercury, and under certain circumstances is capable of being substituted for it. It is, however, defective in the same

\* I have, in the Medical Gazette (Vol. i. p. 953, *et seq.*), entered at great length into the *modus operandi* of mercury and its effects in restoring the Vital Functions, to which I beg leave to refer the reader.

respects as the acids, and has the additional disadvantage of often being oppressive to the stomach in considerable doses, and in small doses it is of little or no use.

From a want of attention to the circumstances under which medicines should be employed, many undeservedly fall into disrepute. We are too apt to view a certain set of medicines as calculated to remove a certain disease, and, as one fails, to use another, without much attention to the properties peculiar to each, or the circumstances of the disease to which these peculiar properties are adapted. If we have recourse to the acids or the dandelion, wherever mercury does not afford the usual relief, we shall often be disappointed. If we employ them in the cases I shall soon have occasion to point out, they will seldom, as far as experience enables me to judge, fail to be useful.

The treatment of the first stage of indigestion, then, consists in promoting the due action of the stomach and bowels, by the various means which have been detailed; and correcting the function of the liver, if it deviates from the healthy state, by the occasional use of mercury, care being taken neither to employ it in greater quantity nor for a longer time than is necessary for this purpose, as its effects on the stomach and bowels are evidently in opposition to the other parts of the treatment.

#### SECTION II.—*Of the Treatment of the Second Stage of Indigestion.*

It appears from what was said of the symptoms of indigestion, that they are liable, after the disease has lasted for a longer or shorter time, to undergo a considerable change; the region of the stomach becoming tender on pressure, the pulse tight, and some tendency to fever supervening. These symptoms characterize what I have called the second stage of the disease.

The period at which this change happens, we have seen, is nearly as various as that at which the deranged function of the liver shows itself, which it sometimes accompanies from its first appearance, but hardly ever precedes. In most cases, the above-mentioned symptoms do not supervene till the function of this organ has been disordered for some time, or its disordered state has repeatedly occurred. It may also be observed, that like the disordered state of that function, they are apt to come and go for some time before they are established. This is true, even of the tenderness on pressure. On one day,

it shall be considerable, and, even on the next, without the use of medicine, it shall have disappeared. In most cases, however, it is more stationary from the first, and, if the disease lasts, it always becomes so.

As soon as the symptoms characterizing the second stage are established, we find that bitters and aromatics cease to give any effectual relief; and in many cases the most stimulating in particular increase the feverish restlessness that occasionally assails the patient, and that languor and uneasiness which seldom wholly leave him. If, in consequence of his increasing complaints of debility, his medicines are changed for others of a more strengthening nature, the effects are still worse; and he often thinks that his disease admits of no relief, but from aperients, and particularly mercurial aperients, of the good effects of which he is always sensible, and, consequently, is very apt to fall into an excessive use of them: and many medical men appear to have arrived at nearly the same conclusion, for it is not unusual to find them declaring, that they see little good done in cases of long standing except by purgatives and mercurials, a principle which has sometimes been applied even to the earlier stages.

Unless I have been deceived by a pretty extensive experience of the phenomena of this disease, there is no stage of it to which this principle is applicable. We have seen that purgatives and mercurials, properly employed, are valuable medicines in the first stage. We shall also find them so in that we are about to consider. But in both they are only part of the means of cure, and, if employed too freely, and to the neglect of others, in all cases do mischief.

The inflammatory symptoms of the second stage of indigestion led me to adopt a practice founded on them, and the immediate relief obtained confirmed the views which had suggested it.

The stimulating plan, which is proper while the fault is in the muscular and nervous powers of the stomach alone, is no longer effectual. The disease, however, still so far partakes of its original nature, that, were we to regulate the treatment by an attention to the inflammatory symptoms alone, the powers of the system would soon be enfeebled.

The more powerful anti-inflammatory measures, therefore, a very low diet, general blood-letting, &c., are rarely proper,

unless, as sometimes happens, the inflammatory symptoms increase to those of active inflammation. The disease is then of a different nature, and must be treated on the same principles with the other inflammations, although with more than usual caution. The less stimulating of the tonic means employed in the first stage, on the other hand, are often still indicated; the extent to which these or the anti-inflammatory means should be carried, being regulated by the greater or less degree of the inflammatory tendency.

In two other respects, the principles of the treatment in the first and second stages of indigestion differ. In the enumeration of their symptoms, we have seen, that although, almost from the commencement of the disease, various other functions suffer by sympathy with those of the digestive organs, it is in the second stage, both from the longer continuance of the derangement of the central parts, and from the greater severity and more complicated nature of that derangement, that they suffer most. Their affections, therefore, here influence the indications of cure more than in the first stage; and as the strength is more impaired in the second stage, while the means of relief, at the same time, are of a more debilitating nature; an uniform endeavour, as much as possible, to preserve the strength which remains, is here more indispensable. Evacuations, which, while the vigour of the system is comparatively entire, and the patient can be supported by stimulating diet and medicines, have the best effects, at a later period, and where less stimulating means alone are admissible, may be attended with serious injury. The system not rallying now, as in the first stage, the effect of one debilitating measure is still felt, when we are called upon for another; and, if our plans are not regulated with caution, and so directed as at no great distance of time to render a continuance of such measures unnecessary, the patient often suffers less from his disease, than the means employed to relieve it.

Such then are the principles on which, as far as I am capable of judging from repeated experience of the various plans which have been pursued in this disease, the proper treatment of the second stage is founded. An inflammatory tendency is superadded to the derangements which constitute the first stage; stimulating measures are therefore to be employed with more caution, and those of an anti-inflammatory nature become

more or less necessary. The diseased action has spread farther, and the strength is more reduced; our measures must therefore embrace a wider field of practice, and the strength must be husbanded with greater care.

We are now to consider more in detail the means, to the employment of which these principles lead. I shall, in the first place, lay before the reader those which form the characteristic difference between the treatment of the first and second stages of indigestion; then point out how the means, which are common to both stages, should be modified in the one before us; and, in the last place, take a view of the treatment of the sympathetic affections which attend the second stage, and require means directed to the organs in which they have their seat. These, we have seen, immediately lead to change of structure, and may, therefore, be regarded as the link which connects the second and third stages of this varied disease.

*Of the Means of Cure peculiar to the Second Stage of Indigestion.*

THE first thing, which appeared to me to throw much light on the nature and treatment of the second stage of indigestion, was the effect of taking three or four ounces of blood from the tender part of the region of the stomach by leeches or cupping. It was not, I found, merely that the tenderness was relieved, and the pulse softened; but that the patient breathed and walked better, that the bowels were more easily moved, and the skin appeared more relaxed, the feverish tendency, which frequently shows itself in the evening, being in the same degree lessened.

From these observations it appeared, that the effect of the leeches was not that of mitigating any particular symptoms, but of relieving the cause of the whole; because it is only on this supposition that such general relief could be afforded.

But even these, I found, were not the whole effect of the local blood-letting. On resuming the plan of treatment, it soon appeared, that the patient bore the use of stimulants much better than before; and in some instances, a recurrence to the treatment of the first stage, under such circumstances, removed the disease. It seemed to have been the slight inflammatory action, which the local blood-letting relieved, that

alone had prevented the beneficial effects of these means. I have thus had repeated opportunities of seeing the patient, after the local blood-letting, quickly restored to health by a plan, little different from that which had previously been employed in vain, and sometimes with an aggravation of the symptoms.

But so fortunate an issue, I soon found, was only to be expected where the second stage had been of very short duration, or the constitution was particularly favourable. On the tonic plan being resumed, the tenderness of the epigastrium was generally soon renewed, and a repetition of the local blood-letting became necessary. Each repetition to the same extent generally produced less relief than the preceding, and if a larger quantity was taken, the relief was obtained at too great an expense of strength.

The application of a blister to the part from which the blood was taken, immediately after its abstraction, tended both to increase the effect of the bleeding, and render it more permanent; but even with this aid, its repetition in the more inflammatory cases soon became necessary. In those less inflammatory, blisters sometimes relieved the symptoms without the aid of blood-letting, but, like the latter, they often failed to give permanent relief.

Other measures, therefore, were requisite. The first that occurred was to abandon, in such cases, the more stimulating parts of the treatment; and although the patient generally felt a degree of sinking and debility from this change, particularly if made too suddenly, these symptoms were less permanent than when repeated bleedings were employed, and the constitution gradually accommodated itself to the change.

The lighter bitters, and those stimulants whose effects are more exerted on the nervous than the sanguiferous system, could in general still be borne. Among many hundreds, I have seen but few who could not bear the occasional, though not the regular, use of aromatics, or of ammonia and some of its preparations; and almost all could take the infusion of camomile flowers or bitter orange-peel, with the exception of those whose peculiarity of constitution did not admit of the use of bitters at any time: and with regard to diet, although in the most inflammatory cases few could bear well the most stimulating kinds of meat, particularly beef, a little chicken

daily, or once in two days, was generally borne without inconvenience, and supported the strength more, and agreed better with the stomach, than a diet composed wholly of vegetable food.

Nor have I found it necessary in such cases wholly to abstain from the use of wine, although it has generally been advisable to lessen its quantity, and often to take it diluted. It is seldom, I believe, proper to reduce the diet more than this, unless active inflammation be threatened. In a few, particularly when a considerable degree of tightness of pulse, notwithstanding the use of the above means, continued, I have seen a diet composed of the farinaceous vegetables, and even a total abstinence from wine, which is much less permanently stimulating than animal food, strikingly beneficial. The appetite sometimes improves very much on lessening the quantity of animal food. This depends in part on other food affording a less proportion of nutriment, but very much, I believe, on the tendency to fever being lessened by the change; for when there is little of this tendency, much less effect is observed from it.

The state of the bowels in such cases is often influenced by the diet in a very remarkable manner. They are not only torpid under the use of animal food, but purgatives act imperfectly, and with irritation. On using a farinaceous diet, they are frequently relaxed without the aid of medicine; and if purgatives are still necessary, they act in smaller doses, and, if this diet does not disagree with the patient, without irritation. It has generally been found better, however, to obviate the inflammatory tendency by other means, than to adopt so low a diet as to produce any material reduction of strength.

Here then it was necessary in many cases still to look for other means in addition to those I had employed for the purpose of reducing the inflammatory tendency. Saline medicines naturally presented themselves, and their effects have answered my expectations. I have found none equal to nitrate of potash taken in two or three table-spoonsful of water, in which a little gum has been dissolved. The gum seems, by defending, in some degree, the stomach and bowels from the irritation of their contents, which tends to counteract the cooling property of the nitrate, sensibly to conduce to its effect. If much be added, however, it is apt to oppress the stomach. From eight to twelve grains

of the nitrate in an ounce of water, with a twentieth part of mucilage of acacia, have been given three times a day, and when the skin became hot generally, or the hands and feet began to burn, repeated every hour, or hour and half, while these symptoms continued. Two or three doses thus taken seldom fail to reduce the increased temperature, and relieve the restlessness which it occasions; and thus, simple as these means are, they often procure good nights, when the want of sleep, as frequently happens in this stage of the disease, is the effect of feverishness. I shall more than once have occasion again to speak of the effects of the nitrate of potash in the treatment of this disease, in many cases of the more advanced stages of which there are few more valuable medicines. The common saline draught, the sulphate of potash, and other medicines of this description, have similar effects, but none of them appear to me equal to the nitrate just mentioned\*.

It is not to be overlooked, however, that all such medicines are debilitating. I have known injury done by too free a use of them, the powers of the stomach being farther enfeebled, and a greater degree of general nervous debility induced. But, it is only when they are used incautiously, that these effects are to be apprehended. I have met with a few, in whom even small doses of the nitrate of potash occasioned irritation and debility.

In addition to the foregoing means, rather a freer use of aperients than in the first stage has been found useful. Aperients not only promote the action of the bowels, but occasion a freer flow into them of the bile and pancreatic fluid, and the fluids of the various glands of the canal itself. We have also reason to believe, indeed, that they stimulate the absorbent, as well as excreting vessels, a languid state of the bowels being unfavourable to nutrition.

The disease, however, partakes too much of a chronic nature to admit of great habitual evacuations of any kind; and, although the free action of the bowels is indicated here, not only as a means of exciting the various functions of the canal, but of allaying inflammatory action, I have seldom found

\* The carbonic acid gas, disengaged when the saline draught is taken in a state of effervescence, is grateful to many stomachs; to others it is oppressive, and the draught seems to agree better with the stomach when the effervescence has been allowed to subside.

more than two or three evacuations in the twenty-four hours proper; and even this should not be continued for many days together. The call for it is greater than in the first stage, but the patient is less able to bear it, and unless a considerable degree of the inflammatory disposition, or a collection of irritating matter render a more frequent discharge necessary, one free action of the bowels daily, or two, if their action be less free, are sufficient, and with most patients, except where the head is particularly affected, a free action of the bowels every second day is generally better than every day. Their repose for eight and forty hours both lessens irritation and otherwise saves the strength. Constipation, on the other hand, should be carefully avoided, both from the direct injury it does, and because it is difficult to remove it without means which risk too great an effect. Purgatives, on the whole, can hardly be here regarded as among the means employed for the purpose of relieving inflammatory action. They must be used chiefly for the same purposes as in the first stage, and consequently belong rather to the means we are next to consider.

When the inflammatory symptoms continue to recur after the temporary relief obtained by the preceding means, a perpetual drain, established in the most tender part, is often followed with the best effects. I have seen cases, with this aid, yield to the means which they had long resisted without it.

*Of the Means of Cure common to the First and Second Stages of Indigestion.*

WITH regard to the modification, in the second stage, of the means common to both stages, in considering the anti-inflammatory measures suited to that stage, I have necessarily been led to make such observations on diet, aperients, and the use of stimulants and other tonics, as apply to it.

When the first stage of indigestion, we have seen, has continued for some time, the function of the liver becomes disordered. A greater or less tendency to disorder in this organ, after it once appears, always continues throughout the disease, so that it is a constant attendant on the second stage; and those medicines which influence the secretion of this organ, therefore, always form part of its treatment. Of these we still find mercury by far the most efficacious.

Several circumstances render caution, in the use of this me-

dicine, even more necessary in the second than in the first stage. Not only has the greater continuance of the disease occasioned a greater loss of strength; but its increase, and the change which has taken place in its nature, render it necessary to employ this medicine for a longer time, and often in a way that more directly influences the state of the constitution.

In the first stage, we have seen, we want only the local effect of the medicine on the stomach and bowels; and in the earlier periods of the second stage, and even later in mild cases, we still find that this effect of it, particularly of the blue pill, repeated for a longer time, is often sufficient, especially when the anti-inflammatory measures we have been considering are duly employed.

When it is sufficient, no other should be attempted. But in many cases, and in a large proportion of those of long standing, it fails. The relief afforded by the occasional doses of mercury gradually becomes less, and they at length cease to be of any essential use.

When it is given in such doses, as to produce a considerable effect upon the bowels, partial relief is still often obtained; but in the more severe cases the strength fails under this employment of it; and the relief afforded does not extend to the most essential part of the disease. In the more serious cases, while the patient is relieved for the moment, we find the slow change which leads to the disorganization of some vital part going on, and constantly occasioning a renewal of the symptoms; which are thus relieved at an expense of strength that accelerates the fatal termination: and, beneficial as occasional doses of mercury, of such power as produce a considerable sensible effect, usually are in the earlier periods and milder forms of the disease, it may often be questioned whether in confirmed cases they do more good or harm.

Finding so little advantage from the usual mode of giving mercury in the second stage of indigestion, when it does not soon show a tendency to yield; and that all means are so generally unsuccessful in the last stage, which, in the more severe and obstinate cases, we may always fear is at hand; I was led to try the effect of more frequently repeated doses of this medicine, so small, that if they did little good, nothing, at least, was to be apprehended from them.

I have frequently given a grain of the blue pill, generally only half a grain, and in very irritable habits, a quarter of a grain or even less, three times in every twenty-four hours, till the secretion of bile appeared to be healthy, repeating these doses when it was again disordered; and by such means, which may appear to many little better than trifling, I have seen the bile gradually restored to a healthy state, when larger doses had been employed in vain. These minute doses not only often succeed where larger doses fail, but the change, in proportion as it takes place more slowly, seems generally to be more permanent.

The correction of the state of the bile, however, is but one of the effects of such a plan. Along with its improvement, the skin generally becomes relaxed, and of a proper temperature, the pulse more dilated, the colour and expression of the countenance better; and, in particular, that expression of languor so peculiar to the advanced stages of the disease, abates. As all these changes depend on a common cause, and consequently take place together, the state of the bile, which should from time to time be ascertained, is a good indication of the general effects of the medicine.

It is true that the most transitory effects of mercury, when they correct the state of the liver, at the same time produce many of the foregoing effects, the diseased state of other parts being supported by sympathy with that of the alimentary canal. But this is chiefly observed in the first, or the milder cases of the second, stage; while, in the more serious and protracted cases, the affection of these parts, from its frequent recurrence and longer continuance, becoming, as we have seen, more obstinate and less immediately dependent on the original disease, resists the occasional exhibition of the medicine.

On this the good effects of the plan I am here considering seem chiefly to depend. The mercury being given in minute doses, it enters the system and acts directly on the various organs, now too much implicated in the disease to yield to its sympathetic effect: yet, from the smallness of the quantity, it is unattended by the bad consequences of what is called a course of mercury.

The slow appearance of the beneficial effects discourages the hopes of the physician, and, as I know, in many instances,

has caused the plan to be laid aside. It is difficult besides to persuade the patient that any plan which produces no immediate sensible effect can be much relied on; for I have always made it a rule to discontinue the mercury even in this stage of the disease, when the slightest affection of the mouth showed itself, and any degree of salivation has generally seemed to me to do more harm than good.

It is above five and twenty years since I first adopted this mode of using mercury in the case before us, and I have now great satisfaction in stating, that many men of experience, in our profession, who, at first, believing that no good could result from such minute doses, viewed the practice as little better than a waste of time, have since confessed, that it gave a degree of relief which could not be procured by larger doses. This, and my own repeated experience of its effects, enable me to speak of them with confidence.

Although we do not thus obtain the sudden benefit which results from a more vigorous practice, we avoid the mischief it often does, particularly in cases of long continuance; and whatever good effect is produced, is allowed, if I may use the expression, to accumulate in the constitution. We are not undoing on the one hand what is done on the other, which, with all the care that can be taken, is very often the case when larger doses are employed. In such a gentle course, however, when the strength can bear it, and the fulness of the region of the duodenum is considerable, the occasional, though much rarer, use of a moderate dose of calomel, carried off by a saline aperient and senna in the morning, often both gives present relief and accelerates the cure. In obstinate cases, where the strength, notwithstanding, is very entire, the more frequent repetition of such doses, combined with the mild alterative plan, I have found a very powerful means of relief.

It is almost unnecessary to observe, after what has been said, that to render the plan most successful, the various observations respecting diet and exercise, and the occasional aids of aperients, local blood-letting, blisters, and cooling medicines, must constantly be kept in view; and if the blue pill, or the hydrargyrum cum creta in about twice the dose, occasion any irritation of the bowels, which often arises from the continued use even of the doses here recommended, it must be obviated by anodynes.

For this purpose I have found the compound powder of ipecacuanha, the extract of poppies, and henbane, the best means; and I have, for the last eight or ten years, been in the habit of combining equal quantities of the last of these with the blue pill, as a preventive; and have experienced from it not only this advantage, but some good, from its general sedative effect on the system; and it will easily be believed that the extract of hyoscyamus, in doses not exceeding a grain, given two or three times a day, hardly ever produces inconvenience of any kind except where the head is much affected.

If the irritation, occasioned by the internal use of the mercury, cannot be allayed, its external use may here be tried, the dose being proportioned to that recommended internally. From a scruple to half a drachm of the weak mercurial ointment may be rubbed into the skin every evening. This way of employing it, however, is objectionable in the case before us; by it the medicine is less effectually applied to the chief seat of the disease, and the quantity received is much less easily ascertained. I have already had occasion to observe, that the external use of mercury often little influences the state of the bile, till it produces some effect on the mouth.

If even this use of it irritate the bowels, which may happen, particularly in the advanced stages, when they have already suffered much, and we cannot obviate that effect, it must be discontinued; and only renewed at intervals, for the time that the bowels can bear it without irritation. Beyond this, even the smallest doses do more harm than good.

In the few constitutions, in which no dose of the blue pill can be taken without disordering the stomach, I have substituted for it, with good effect, a sixth or eighth, and sometimes even so small a dose as a sixteenth part of a grain of calomel, combined with some anodyne; but this preparation is not so well suited to the objects in view.

It is not uncommon, in all constitutions, for a few grains of the blue pill to occasion a slight pain referred to the stomach soon after it is taken, which continues for half an hour or more, and this symptom sometimes arises from smaller doses; but it is seldom of much importance, and often ceases to recur after a few doses have been taken.

I have not found it necessary to confine the patient under the foregoing plan, while his strength is equal to the exertion

of going abroad, except at night and in bad weather; and this degree of confinement his disease requires, independently of medicine.

It is to the second, rather than the first, stage, that the substitutes for mercury are best adapted. The mineral acids, it is observed above, particularly a combination of the muriatic and nitric acids, and the dandelion, appear to be the best.

Much has of late been said of the external use of these acids. Both their internal and external use have appeared to me best adapted to cases of some continuance, where the inflammatory tendency has been to a great degree subdued, and small doses of mercury have been employed without the usual benefit. In such cases, I believe, the use of the acids will almost always be found better, than increasing the quantity of mercury beyond what produces the slightest indication of its presence in the gums. If the habit bear the mercury well, the acids may be used in aid of it; for it rarely happens, if the minute doses alone are employed, that their use causes the mercury to irritate the bowels.

When the latter, either on account of its effects, or the debilitated state of the patient, can only be used at intervals, the intermediate use of the acids is generally of considerable service. They tend at the same time to restore the strength and prolong the effects of the mercury. According to my experience, the external use of the acids, recommended by Dr. Scott, is in many cases more powerful, both as a substitute for mercury, and a means of correcting its debilitating effects, than their internal use. It consequently requires more caution, where there are any considerable remains of the inflammatory disposition; I have known it produce an alarming increase of the inflammatory symptoms. Its effect, however, is uncertain, and in some constitutions it appears to be wholly inert.

The dandelion, I believe, possesses greater powers in this disease than are usually ascribed to it, but it requires to be taken in very large doses. It is best adapted to those cases in which the bile is deficient or much disordered, while the power of the stomach is still considerable. In such cases, I have seen the patient restored by a strong decoction of dandelion used for common drink, without the aid of any other medicine. In addition to its effect on the liver, it tends to

cool, and consequently allay the inflammatory disposition, and often excites both the bowels and kidneys. The last effect, which is best counteracted by alum, when the stomach bears it well, is sometimes such as to make it necessary to discontinue the medicine. The effect on the bowels is seldom considerable, and can always be restrained. It is often given with great advantage in aid of small doses of mercury when the stomach bears it well, and enables us farther to diminish the mercury. I shall have occasion to make some additional observations on it in speaking of the treatment of the more protracted cases and the third stage of indigestion.

*Of certain Trains of Symptoms whose Treatment does not fall under the general Plan of Cure.*

It appears, from what I have already had occasion to say, that the symptoms, which arise when the sympathetic affections often acquire an existence independent of the cause which produced them, and consequently to require a plan of treatment directed to the parts they affect, show themselves at various periods in different cases. The earlier they show themselves, they are generally of a more inflammatory character; the later they appear, they are the more obstinate, and the more apt to run into change of structure. This is at all times their tendency, and it is therefore, as I have already had occasion to remark, that they may be regarded as the link which connects what I have termed the second and third stages of indigestion; the former characterized by the presence of the inflammatory tendency; the latter by the frequent consequence of its continuance, change of structure in some vital part.

The class of symptoms, of which I am speaking, more than any other, tends to render the disease complicated, and consequently at first view obscure; but a careful study of them unfolds its true nature, the manner in which it extends its influence throughout the system, and the steps by which it is capable of disorganizing any part of it.

Some of the most striking features of the disease before us, we have seen, arise from the manner in which distant parts sympathize with the stomach. The nature of the affection of

these parts, it was observed, corresponds with that of the stomach itself. In the first stage it is a mere nervous affection, ceasing as soon as the cause of irritation from which it arises ceases. In the second stage they become inflammatory affections, which gradually acquire an existence independent of that cause; for the occurrence of the inflammatory tendency in the stomach immediately produces the same tendency throughout the system, and to such a degree, indeed, that inflammation readily arises in those parts which most sympathize with the stomach, even from causes not connected with the disease.

The secondary symptoms of indigestion are most easily excited in infancy, and least so in advanced periods of life. In infancy too they are most speedily fatal; but it is from puberty to about forty years of age that they are most frequent, because, at this period, their causes are most frequently applied, and the susceptibility of the constitution is not yet greatly impaired. Besides, after forty, we have seen, the disposition to indigestion is less.

It appears, from the enumeration of the symptoms of indigestion, that the liver is the first organ which partakes of the disease of the alimentary canal. In the first stage, we have seen that its function is sooner or later deranged; and in the second, that the inflammatory tendency of the pylorus, in most cases, extends to it. It is also the organ which is most frequently the seat of those trains of symptoms, which we are now about to consider.

It is not uncommon, in the second stage of indigestion, when the patient takes cold, or is exposed to other causes of inflammation, or, indeed, without any evident cause, for the right side of the abdomen to become full and tender on pressure, with a sense of oppression and an increased tightness of pulse, often accompanied with some degree of difficulty of breathing and a dry teasing cough. He sometimes complains of pain in the right, frequently in the left side, or in the pit of the stomach, or in the right, or sometimes in the left shoulder, and experiences some uneasiness in lying on either side, most frequently on the left, a greater than usual derangement of the biliary secretion accompanying these symptoms. In short, he evidently labours under inflammation of the liver.

It is seldom, however, of the most active kind, requiring general blood-letting, which is fortunate, as patients of this description rarely bear loss of blood well. I have seen many who had long laboured under indigestion unable to bear the necessary loss of blood, when attacked with acute inflammation. They are, however, comparatively, little liable to it. Their inflammatory attacks generally partake of the chronic nature of the habitual disease, and for the most part yield to local blood-letting and blisters, with the aid of a mild diet and saline and aperient medicines.

This treatment, combined with small doses of blue pill, never fails soon to relieve the affection of the liver we are here considering, till its frequent recurrence has rendered it obstinate, and produced some tendency to change of structure.

The pain, it has just been observed, is often felt in the left side, while the tenderness on pressure is wholly confined to the right; but, after the affection of the right side is relieved by evacuations from the tender part, it is not uncommon for the left side to become both full and tender, the inflammatory affection appearing to attack the spleen, as soon as the liver is relieved from it; and it will sometimes, on the fulness and tenderness of the left side being relieved by the same means, return to the liver. This alternation I have frequently seen happen more than once before the disease subsided, in those who had long laboured under the second stage of indigestion.

Sometimes, though much more rarely, the fulness and tenderness appear in the left side alone. The pain is then more confined to the seat of the tenderness. The same means are here proper, with the exception of the blue pill, which seldom seems to be of much service in this affection; and the employment of which must therefore be regulated by the state of the other symptoms.

The chief seat of the sympathetic affection, however, is often in organs at a greater distance from that of the original disease. I shall, in the first place, mention the lower bowels, because these are more immediately connected with the disease, and are injured, not only by sympathy with the higher parts of the canal, but directly influenced by the vitiated secretions and the undigested food.

The irritation of bowels, which attends the first stage, is for

the most part easily relieved by purgatives and anodynes. In the second stage it often becomes obstinate, and shows the same inflammatory tendency which now characterizes the primary disease. The abdomen becomes full and tender on pressure, and the irritation which exists there increases the general tendency to fever. This tenderness is more general and less defined than that which characterizes the second stage of indigestion, and is often greatest in the middle and lower parts of the abdomen.

We should *à priori* expect that the lower bowels would suffer more than other parts of the canal, especially when the disease is of long continuance, for the same reason that the lower orifice of the stomach suffers more than any other part of that organ, the morbid contents of all the rest passing by them. The sigmoid flexure of the colon appears to be the part most liable to be affected, probably from the contents lodging there longer than in other parts of the large intestines.

It is not uncommon, in protracted cases, to find a considerable degree of tenderness in the seat of this part, which is sometimes, though rarely, at length even affected with ulceration. It is also, probably for similar reasons, common, though not so much so, to find tenderness on pressure in the seat of the cœcum. In other instances it is more general.

Opening medicine, in such cases, seldom gives much relief, and often increases the irritation; nor have I found any means effectual without those which lessen the inflammatory state of the parts. The application of leeches to the part most tender on pressure, and the use of mucilaginous and anodyne clysters, seldom fail to give relief, and then mild aperients generally succeed in procuring a free action of the bowels. It is sometimes necessary to repeat these means, and when the symptoms are obstinate their good effects may be promoted by the tepid bath; but I have seldom found fomentations of the abdomen of much use, although a large poultice applied over the lower part of it appears to be of service.

Both from the passage of the vitiated contents of the bowels, and from the return of the blood through the hepatic system being rendered less free, those who have long laboured under indigestion are particularly subject to piles. Great relief is generally obtained in the affection of the bowels, we are con-

sidering, when they bleed freely; and when they exist to a considerable degree without bleeding, the application of leeches to them is sometimes the best mode of letting blood in that affection. I have repeatedly observed, even where it had not gone the length of producing decided inflammatory symptoms, but the patient had for some days been teased by scanty, irritating, and unsatisfactory evacuations, that, after a small spontaneous discharge of blood from the piles, the bowels have emptied themselves with freedom and ease. Foreign, particularly French physicians, place great reliance on bleeding from the seat of the piles, in all inflammatory affections of the bowels. Dyspeptics, we have seen, are often subject to more or less permanent spasmodic stricture of the rectum; this is most apt to occur when some degree of inflammatory tendency in the bowels has supervened, and we have reason to believe that, when frequently renewed, it may end in organic stricture. This, however, is certainly not a frequent occurrence. When indigestion is complicated with organic stricture of the rectum, it will generally be found, I believe, that the stricture is the primary disease. Both the spasmodic affection, and the state of irritation just mentioned, are often relieved by abstaining from animal food for a day or two.

Every cause of irritation of the alimentary canal is apt to renew the inflammatory tendency in the bowels, particularly the repeated use of mercurial medicines. It is also frequently renewed by cold or other causes of inflammation. The best means of prevention are a very mild and rather mucilaginous diet, and a free state of the canal. On this and some of the other secondary effects of indigestion, which I am about to consider, I have entered more fully than can be done here in my "Treatise on the Prevention of Organic Diseases."

The chest frequently suffers in the second stage of indigestion; the difficulty of breathing, which we have seen an occasional attendant at all periods of the disease, becomes more permanent, with a sense of oppression and difficulty of lying in the horizontal posture, especially on the sides, most frequently the left side, and an increase of the tenderness of the stomach, the tightness of the pulse, and often of the burning of the hands and feet. The feeling of oppression is greater than seems to belong to the degree of difficulty of

breathing, and is much increased by all active exercise. A short dry cough sometimes attends, but is by no means a constant symptom; a circumstance which, with the absence of anything that deserves the name of fever, often deceives respecting the inflammatory nature of the affection. Blisters generally give relief; but we still find local blood-letting the most certain and expeditious means.

The increase of the tenderness in the region of the stomach, tight pulse, and feverish symptoms, distinguish this affection from another species of permanent dyspnoea, which we found a frequent attendant on indigestion, and which I shall soon have occasion more particularly to consider. The latter seems to be wholly a nervous affection, and frequently to be the effect of repeated attacks of the former, which is still apt to be renewed, and consequently to become complicated with it, when the patient is exposed to taking cold, or other causes of inflammation.

Palpitation, we have seen, is not an uncommon symptom of indigestion, and is, for the most part, readily relieved by means already pointed out; but in some instances the affection of the heart becomes so obstinate, that I have even known it assume the form of angina pectoris, and be treated in vain as such, for several years; yielding, at length, to means which restored due power to the digestive organs. All affections of the heart, becoming obstinate in the second stage of indigestion, with an increased tightness of pulse, are relieved by local blood-letting, and I have seen decided inflammation of the heart supervene under such circumstances, requiring the frequent repetition of copious general blood-letting.

It is a common observation that inflammation of the heart is apt to supervene after repeated attacks of rheumatic pains of the limbs. I believe, from many cases which have fallen under my observation, that it will generally be found, in such instances, that the rheumatic pains had been combined with, and in a greater or less degree dependent on, disorder of the digestive organs.

The pains of the limbs arising from this cause, will often completely assume the form of rheumatism, and become very obstinate, if the cause which supports them be overlooked; which is the more likely to happen, because here, as in other

cases, cold is very often their immediate exciting cause. I have often seen severe pains of the limbs, which had long resisted the means usually successful in rheumatic cases, wholly removed by combining with these means the treatment adapted to the second stage of indigestion.

BUT of all the sympathetic affections of distant parts in indigestion, none are so frequent as those of the head. In the second stage, they usually assume the same inflammatory character with the other affections belonging to this stage.

Head-ach, we have seen, is one of the most common symptoms, both of the first and second stage of the disease; sometimes, indeed, indigestion shows itself only by this symptom. In the milder cases this is by no means uncommon, and it now and then happens in the most severe. I was one of many physicians who were consulted in a case where violent pains of the head had resisted every means which could be thought of. The disease proved fatal, and we expected to find great disorganization in the head, to which all the formidable symptoms had been referred. No trace of disease, however, could be found in it, and the organization of the liver was wholly destroyed.

In the first stage head-ach is generally a mere temporary affection of the nervous system, and, indeed, frequently supervenes on other nervous symptoms, which it relieves. It is particularly apt to be preceded by affections of the sight, and may often be removed by emetics and cathartics, which remove the immediate cause of irritation. When severe, indeed, it is frequently relieved by spontaneous vomiting. The head-ach of the second stage is often more obstinate. Emetics and cathartics, indeed, also frequently relieve it, because these not only tend to remove the cause of irritation, but occasion, the former immediate, the latter eventual, depletion of the vessels of the head. The most effectual remedy, however, is blood-letting from the head or its immediate neighbourhood. The head-ach of the first and second stages of indigestion, besides the accompanying symptoms, may generally be distinguished by the latter being greatly increased by stooping, or when the patient holds his breath, and forces the blood towards the head, while this is rarely the case with the head-ach of the first stage, and

never to the same degree ; a circumstance very characteristic of the nature of these affections.

The head-ach of the second stage sometimes becomes very formidable when its inflammatory nature has not been understood, occasioning the most agonizing pain, and even delirium. Cases have rarely occurred to me in which bleeding from the head did not give more or less immediate relief. Blistering the nape of the neck is often of service, but as it often fails, and the relief is never so speedy, and seldom so complete as from local blood-letting, the latter, unless the strength is much reduced, is preferable ; to say nothing of its effect on the habit in general, which, when the head-ach has frequently returned, is beneficial,—for local, of course, is also general blood-letting as far as it goes ; and from the nature of the circulation in the head, the blood being returned from it by inanimate canals which cannot partake of the general excitement, there is no other inflammatory affection to which a generally increased action of the sanguiferous system so much disposes as to that of the brain ; one among many more direct proofs of the action of the vessels in propelling the blood. Blisters are a powerful means of taking off the remains and preventing the return of the pain.

It often happens, apparently for the reason just mentioned, that this inflammatory state of the head requires a lower diet, and more frequent repetition of the blood-letting, than the other affections we have been considering.

Here, as in all cases of inflammation, however little general blood-letting may seem to be indicated in the first instance, when local blood-letting has been frequently repeated, without subduing the tightness of the pulse, or preventing the recurrence of the symptoms, the greatest advantage often arises from letting blood generally. In such cases, indeed, it becomes indispensable. The strength may be exhausted by the constant repetition of the local blood-letting, without the tendency to the disease being subdued.

From the blood being taken more slowly, local, even to the same extent, never produces the whole effect of general blood-letting. I have repeatedly seen the pulse softened, and the recurrence of the disease prevented, by one general blood-letting, and that to no great extent, when frequently repeated

local blood-lettings had had little effect beyond the present relief they afforded.

General and local blood-letting relieve inflammation in different ways. The former, by lessening the general force of the circulation, tends to prevent farther congestion in the inflamed part; the other, by lessening the quantity of blood in the part, to relieve more directly that which has already taken place. Now, in the most severe cases, although the quantity of blood in the inflamed part is repeatedly lessened, and thus the inflammation for the time relieved, the general inflammatory action continuing, the vessels again suffer distention, till this action is subdued by general loss of blood. Sometimes the vessels in very protracted cases, from their repeated distention, seem so weakened, that with the usual force of the circulation they are unable sufficiently to contract on their contents even to afford the temporary relief local blood-letting usually gives. In such cases the patient will often observe he no longer derives from it the relief he used to experience.

On the other hand, I have seen many cases where repeated general blood-letting had failed to subdue inflammation, in which it has ceased on the local abstraction of blood. Here the generally increased force of the circulation had been sufficiently subdued; but the long debilitated vessels could not, even under these circumstances, recover their usual diameter, till more directly relieved from the blood which had over-distended them.

Blistering is then often eminently serviceable, and seems, through the nervous system, to excite the vessels of the part to a more vigorous action. Here, as in other similar instances, the stimulus seems to act through the general source of nervous power; more particularly affecting the vessels in the neighbourhood of the blister from the sympathy of all neighbouring parts.

It is evident that it is in protracted cases that both the states just pointed out must occur. Their existence seems sufficiently to evince the propriety of combining local and general blood-letting in all cases of active inflammation.

To the mere anatomist it would appear unaccountable that the inflamed vessels of a viscus should be emptied by taking blood from those of the skin in its immediate neighbourhood,

there being no immediate connexion between the two sets of vessels; but the phenomena of disease assure us of the fact, that by sympathy the vessels of neighbouring parts always partake of the state of each other, whether it be a state of increased distention or contraction. As that state of the vessels which causes inflammation spreads to neighbouring parts, independently of any particular connexion either of nerves or vessels, that which relieves it does so likewise.

By local blood-letting, except in external inflammations, we take no blood from the part affected, but while the functions of life continue, by causing the vessels of the surface to contract, it produces by sympathy a corresponding effect in all neighbouring vessels.

If the foregoing observations be correct, little advantage is to be expected from general blood-letting, when there is little general increased excitement of the circulation. This inference seems fully warranted by experience, for under such circumstances, the loss of two ounces of blood from the part affected often gives more relief than that of a pound from a distant part.

Blood-letting seldom does much good in the head-ach of the first stage of indigestion. If it is not relieved by clearing the stomach and bowels, and the use of what are called nervous medicines, a pretty large blister applied to the nape of the neck, or behind the ears, is the most effectual remedy.

The effect of nervous medicines, in relieving it, is often considerable, but very uncertain. In many cases they seem to do little or no good. Valerian and conium appear to be the most frequently successful. Opium is ill adapted to this head-ach, any relief obtained from it being generally more than compensated by its other effects.

Opium, in the head-ach of the second stage, is, with few exceptions, out of the question; but I have found that, after the hardness of the pulse is to a certain degree subdued, such a use of the compound powder of ipecacuanha as supports a general tendency to moisture on the surface, provided means are employed at the same time to keep the bowels free, is useful in preventing its returns. The effects of this medicine seem sometimes improved by combining an antimonial with it, and almost always by saline medicines.

In many cases, particularly in the early period of the second

stage, and when its characteristic symptoms are not very prominent, the head-ach seems to partake of the nature of both stages, and is best relieved by a combination of the above means. In all kinds of head-ach, from indigestion, except the most inflammatory, I have seen relief from a full dose of opium and carbonate of ammonia, combined with as much ipecacuanha as the stomach would bear.

It sometimes happens, in the second stage, that the head-ach assumes a chronic form, continuing for weeks, or even months, without being very severe. Both local and general blood-letting then very frequently fail to give permanent relief. The best means are those which support an habitually free action of the bowels and skin, and most effectually correct the disease of the digestive organs; and permanent drains from the neighbourhood of the head. In such cases I have sometimes seen great relief from sleeping with an oiled-silk night-cap when it occasioned, as it often does, a sensible moisture of the hair.

I NEED not here dwell on the affections of the skin so apt to appear in the second stage of indigestion, and often requiring local treatment, combined with the treatment of the original disease. These assume the form of erysipelas, pustules, &c., all evidently of an inflammatory nature. They can only be effectually relieved by relieving the disease from which they arise. Those medicines which more directly promote the due action of the skin always aid other means.

It was observed, in speaking of the relation which subsists between the sympathetic affections which attend indigestion and the original disease, that the relation between the latter and urinary gravel depends less on any sympathy which exists between the stomach and kidneys, than on the generation of acid in the alimentary canal in indigestion. We find this observation farther illustrated by the class of symptoms we have just been considering.

We have seen that the organs, sympathetically affected in this disease, are peculiarly liable to inflammatory affections in the second stage, producing the different trains of symptoms which have been laid before the reader. The kidneys, however, are among the parts least apt to show any tendency of this kind;

although it is not uncommon, in indigestion, for the acrid state of the urine, arising from superabundance of acid and its other saline contents, occasioned by the greater generation of acid in the alimentary canal, and the inactivity of the skin, so to irritate the urinary passages as to occasion frequent micturition, and a sense of burning, and other painful sensations in these passages, even when no deposition of lithic acid takes place in them.

Such symptoms may generally be relieved by diluting and mucilaginous fluids, as far as the state of the digestive organs admit of them, but they can only be permanently removed by preventing the morbid generation of acid in the alimentary canal, and restoring due action to the skin. A combination of the uva ursi and henbane often affords relief.

It is almost unnecessary to observe, that in all such cases as those we have been considering, we must keep in view the origin of the disease. The debility of the digestive organs, although frequently relieved by the secondary disease, is easily renewed by any cause deranging their functions, which always has the worst effect. All the regulations respecting regimen, therefore, and even the occasional use of stomachic medicines, are proper, as far as the secondary disease admits of them \*.

\* I have, during the last twelve years, recommended Galvanism in certain cases of indigestion. I shall have occasion, in the last chapter of this Treatise, to point out the circumstances which led to its employment, the mode of using it, and the effects to be expected from it.

In the Medical Gazette of last year I have considered, at a length which this Treatise would not admit of, the *modus operandi* of mercury, and particularly the peculiar effects of the minute and frequently repeated doses, and the cases to which they are particularly adapted. They are not only in a large proportion of cases the most effectual mode of employing this medicine, but also the safest. It is the only mode of employing it in which its bad effects can with certainty be prevented. Thus employed, mercury is incapable of its more sudden and powerful effects, and therefore not suited to acute cases except in aid of other means, but where time is afforded, as in the subject of this treatise, it is by far the best and often the only means of gradually restoring the functions and, where it can be done by medicine, the structure of the organs concerned. Its operation is that of a very mild but effectual stimulant, gradually restoring their healthy state at no expense to the constitution, whereas with respect to larger doses of this medicine, its good, are always more or less compensated, and sometimes exceeded by its injurious, effects.

## CHAPTER IV.

*Of the more protracted Cases of Indigestion.*

THESE require particular consideration, because in them the disease often assumes a form very different from that observed in more recent cases; and the cure from the increasing debility and the greater obstinacy of the disease, generally proves both more difficult and tedious, and also from the patience of the invalid being exhausted, and his faith in the means of relief shaken.

We have seen the secondary affections in this disease gradually gaining importance in its progress, till, as in the cases we have just been considering, where there is some particular part more prone to disease than the rest, the secondary becomes the principal affection. It is not so much that the derangement of the digestive organs produces any particular disease or set of diseases, but that the state of general irritation caused by it favours the appearance of any disease to which the patient happens to be disposed. When, however, there is no part much more prone to disease than others, the various organs which from the first suffer by sympathy, having their powers more permanently impaired, the disease gradually assumes the form rather of a case of general, and for the most part obstinate, debility, than an affection of any one set of organs.

This form it assumes the more readily, in consequence of a law of the animal economy which has repeatedly attracted our attention; namely, that although the sympathetic tends to increase the original affection, in proportion as the former begins to be changed into actual disease of the part, it tends to relieve the disease from which it sprung. Hence it is, that in the case we are speaking of, in proportion as debility of other parts becomes permanent, and independent of the cause which produced it, the digestive organs are frequently relieved. It is not uncommon for patients, in the state I am speaking of, to express their surprise that they should be so weak, when the stomach performs its office so much better than when they felt comparatively little of this general debility.

This state of the disease necessarily supervenes more readily in some than in others; according as the organs secondarily affected are more liable to disease, and no organ so much weaker than the rest as to induce the disease to fix particularly in it.

We have now, in some degree, a new disease to contend with. The general sympathetic affection has become that of most importance. Even in this case, however, the pulse is still more or less contracted, and a degree of tightness will be readily perceived in it, if it be examined in the way which has been pointed out; a circumstance which, with the history of the disease, and some uneasiness being still caused by pressure in the region of the stomach and liver, readily distinguishes this state from other cases of debility.

Although the state I am speaking of may be considered as comparatively rare, for it is much more common for the diseased action, in obstinate cases of indigestion, to fix principally on one organ; yet we very frequently meet with a state resembling it, before the disease so fixes, and especially in the intervals between the attacks which the part generally suffers before permanent disease takes place in it. To this state, the observations I am about to make equally apply as to that where no organ suffers in particular; except that, in the former, the means which influence the whole system must be combined with those directed to the organ chiefly affected.

I have found the debility most obstinate when least complicated with determination to particular parts, provided change of structure had not taken place in the latter case. The inflammatory tendency is still measured by the tight pulse, which is relieved with difficulty; because, not depending on the affection of any one part, local evacuations influence it but little, nor are they at all the appropriate remedy; and the general state of debility admits of but a very cautious use of those which produce their effect on the whole system. But before considering the treatment peculiar to the more protracted cases, it will be necessary to make some additional observations on the symptoms of most consequence in regulating it.

*Of the Examination by Pressure on the Regions of the Stomach and first Intestine.*

I SHALL begin by some additional observations on a subject, of the importance of which, in the treatment of this disease, I have every year been more sensible,—the examination by pressure on the regions of the stomach and first intestine. The part of this intestine, the examination of which is of most importance, lies lower than the stomach, and towards the right side. It is of consequence to make the examination in the erect position. When the patient lies on the back, the viscera fall from the hand, and it is impossible to judge of their state with the same accuracy.

While the seat of that orifice of the stomach, by which it communicates with the bowels, and by which, consequently, all its contents must pass, is always tender on pressure, in the second stage of indigestion, that of the first intestine is only occasionally so; but the latter is often affected in other ways, an attention to which is of great consequence in conducting the treatment in protracted cases. Pressure, particularly sudden pressure, on this part, in such cases, at the same time that it occasions tenderness, or when it has no degree of this effect, almost always occasions a greater sense of oppression, and more affects the state of the breathing, than pressure on the left side. If the pressure be made on the corresponding places, and with the same degree of force on both sides, the patient will almost always tell you that the left side feels more free than the right, and that there is something in the latter which gives him a sense of obstruction. A difference also is always evident to the hand of the person making the examination. The right side feels fuller and firmer; and if he tries to press the fingers under the ribs in the two sides, he will feel a sensible difference in the ease with which this is done.

It is natural to suppose that, as the liver lies on the right side, these differences may be ascribed to it. On this account I have, both alone and with other physicians, examined in this way healthy people, without the slightest difference between the sides being detected. In a healthy subject the liver lies wholly under the ribs, and on both sides below the ribs we press on nothing but the soft bowels; and when the fingers

are pushed up under the ribs, the healthy liver lies too much out of reach, and yields too easily to admit of our perceiving it in this way. I am the more particular here, because I find that even medical men have sometimes been deceived in these respects. They can, however, readily satisfy themselves by an examination of the healthy subject, which some have done in my presence, and had the candour to allow that they had not sufficiently adverted to the circumstances just mentioned. The truth is, the mind has never been particularly directed to the subject, and it has not, therefore, obtained the attention it will be found to deserve.

Where any decided difference can be perceived between the two sides examined in the ways just pointed out, it is always the effect of disease. I have already fully stated my reasons for believing that the sense of oppression which arises from pressure on the region of the duodenum depends on this intestine not freely discharging its contents. A hand accustomed to make the examination can at once determine to what extent the intestine is distended.

I have of late years regarded the degree of this distention as the best measure of the degree in which the digestive organs are deranged, and it has seldom deceived me. The patient's sufferings are proportioned to the irritability of his nerves, as well as to the degree of his complaint, and therefore are not a correct measure of its degree. When the region of the pylorus is tender, we know that the second stage has commenced; that a general inflammatory tendency, greater or less in proportion to that tenderness, prevails in the system, the removal of which is necessary to recovery. When this tenderness has extended to the region of the first intestine, we know that the affection of the pylorus has extended to it; but this is not merely proportioned to the degree in which the digestive organs are deranged, but to that and the degree of inflammatory tendency in the particular constitution. The difficulty with which this intestine empties itself, on the other hand, very accurately tells us the degree of languor which prevails in the digestive organs, which, compared with the other circumstances of the case, more or less regulates all our means; and so constant a symptom of protracted indigestion is its morbid distention, that, without saying a single word to the patient, the physician

may generally know, by laying his hand on its region, even on the outside of the clothes, whether the case be recent or not\*.

As soon as the weakness of the stomach has spread to the liver, a bile of less active properties begins to be secreted, and in the same proportion the action of the first intestine, where the aliment is mixed with this fluid †, begins to languish, and dyspeptics, often for months, or even years, have constantly an accumulation in this intestine of what ought to be discharged. Not that the same contents remain, for a continual passage through the bowels is of course necessary to life, nor have I ever known an instance in which this passage was interrupted; but the intestine never emptying itself thoroughly, a great portion of aliment is retained there beyond the due time, and is only evacuated in proportion as a fresh supply from the stomach maintains the accumulation; and thus an enlargement, evident to the eye as well as the hand, often takes place; and the patients themselves, particularly women, from the nature of their dress, not unfrequently perceive the body sensibly, and often to a considerable degree, enlarged.

Children are still more inclined to this accumulation than adults, most of their complaints being connected with the state of the digestive organs. Of children who are out of health, with the exception of those labouring under contagious diseases, and they are by no means always excepted, not one in twenty will be found free from more or less of it, and their restoration to health is never permanent till the due action of the first intestine is restored.

\* Here let me correct an error, which some who have carelessly perused my Treatise have fallen into. If they will take the trouble to recur to it, they will find that I never said that the tenderness of the pylorus is of a serious nature, or apt to run into organic disease; but, on the contrary, pointed out that it is in the common course of common stomach complaints, and very rarely, if ever, leads to any thing like organic disease of that part; diseased structure in indigestion almost always occurring in parts at a distance from the stomach, as has already been pointed out. When other fatal diseases give us an opportunity of examining the pylorus in the second stage of the disease, as I have often witnessed, it is found redder than usual; but even where, from long continued irritation, I have found its surface abraded, I have never seen anything like organic disease in it in common cases of indigestion.

† The importance of the due performance of this process strikingly appears, from the well-known experiments of Mr. Brodie.

When this intestine is habitually loaded, no ordinary cathartic will relieve it. It passes through it, leaving the greater part of its contents behind. I have had occasion to remark, that, in the more recent cases, it may generally be emptied by a brisk dose of calomel ; but the accumulation soon forms again, and is only to be permanently prevented, and the patient restored to health, by such means as produce a bile of healthy properties. When this is accomplished, without any sensible effect of the means employed, the intestine empties itself regularly ; and, in nineteen cases out of twenty, the symptoms which had so long harassed the patient then disappear,—one among other proofs that the load on the delicate nerves of this bowel is the chief source of such symptoms.

Another observation made by examination of the region of the stomach, of great consequence both in judging of the state of the disease and regulating its treatment, is, that the tenderness, which, we have seen, is generally confined to the part of that region which lies towards the right side, although in a comparatively small number of cases, is sometimes found to extend across it, and, in some instances, even to be greatest on the left side. I do not speak of the pain ; it is usual, in the most common bilious attacks, and indeed in all cases of indigestion, for a pain to be felt in the left side, but without any tenderness on pressure in its seat. This pain, which I shall presently have occasion to mention more particularly, is generally to be classed with the other sympathetic pains of the disease, whose seat is various and of little consequence. But the case is very different when the tenderness has extended across the region of the stomach, or is confined to the left part of it ; of which, as of its existence when confined to its more common seat, the patient is never aware till accident or the physician points it out.

Of a great number of such cases, I cannot recollect one which did not prove obstinate, unless the tenderness was only of a temporary nature, disappearing at most in a few days. The alterative plans, which are generally so effectual in the more usual form of the disease, are here of little avail, if we except the more direct means of relieving the inflammatory tendency. Mercurials have often appeared to me nearly useless, and, if carried beyond the mildest doses, always pre-

judicial. To what we are to ascribe the tenderness in such cases, is a question of great importance in their treatment. I shall here state what I have been able to collect from my observations on this subject.

I have no doubt, both from the course the disease has taken in various instances, and from the result of dissections, that the extension of the tenderness towards the left side, or its original seat in that side, in different cases depends on different causes, all of which are more unfavourable than the circumstances which cause its existence in its usual seat. When it arises from an affection of the spleen, it is generally easily distinguished by the enlargement of this viscus. The same may be said respecting the liver, when the enlargement of the left lobe, which, for a reason above explained, is always the part of this organ most affected in digestion, is such as to extend to the left side. When this happens, it is generally in those who have suffered from sultry climates, or the use of intoxicating liquors. But pretty extensive observation has convinced me, that neither of the foregoing is the most common cause of the symptom we are considering.

I believe one of its most common causes, and perhaps its most favourable cause when it proves permanent, is the state of the lower orifice of the stomach extending to other parts of this organ. It is not uncommon, on examination after death, in those who have suffered much from indigestion, to find many parts of the surface of the stomach redder than they ought to be, in short, pretty much in the same state in which its lower orifice is more frequently found.

Sometimes, though fortunately very rarely, there is a tendency to organic disease in the left portion of the stomach, which I have seen much thickened and indurated. When this happens, the hardness may be felt externally. But it requires a good deal of caution to ascertain its seat. It may, even by the most experienced, be mistaken for the left lobe of the liver in a diseased state, and extending to the left side. The best means of distinguishing these affections, is finding that the hand sinks into the soft parts between the tumour and the seat of the liver.

It is still more difficult to distinguish it from affections of the part of the colon which lies nearest this part of the

stomach. I have had reason, in many cases, to think that the extension of the tenderness across the epigastric region has arisen from an affection of this bowel.

The best means of distinguishing affections of the stomach from those of the colon are, the digestive process in the latter cases, in proportion to the severity of the local symptoms, being better performed, the state of the bile less disordered, the patient not experiencing the increase of uneasiness which often comes on after meals for a considerable time after eating, and often experiencing more or less pain, or some other uneasiness in the region of the stomach, a short time before the bowels are moved, and more or less relief soon after their action. The general health also suffers less in proportion to the severity of the symptoms than when the stomach is affected.

These observations, however, apply chiefly to the slighter affections of the higher part of the colon, or the early stages of its more severe diseases. In their more advanced stages, the stomach, and other digestive organs, either by actual participation of the disease, or by sympathy, suffer so much, that the diagnosis becomes much more difficult. As the disease, however, while it increases in severity, generally at the same time becomes more extensive, its seat, if it be in this bowel, may often be ascertained by tracing it to a considerable distance in the course of the colon.

The pain of the left side, in what are called bilious complaints, in many cases evidently arises from an affection of this bowel where it turns downwards on that side, being immediately relieved by the discharge of its contents. We have reason to believe, however, that this is not its most common cause, and that, as I have just had occasion to observe, it is generally to be classed with the sympathetic pains of indigestion.

Although this pain, as remarked above, is not necessarily connected with any tenderness of the part, it is often accompanied with tenderness of the ribs and intercostal muscles of the left side, which is a sympathetic affection of the same nature with the tenderness of the cartilage in its more usual seat, the cause of which I have had occasion to consider; only occurring at a greater distance from the chief source of irritation.

With regard to the nature of the affections of the colon,

which sometimes supervene in indigestion, the most usual appears to be merely a degree of languor, causing delay in the passage of its contents, the consequence of the bile and other secretions being less adapted to support its due action. When its contents are longer delayed than usual, they become hardened, and irritate the surface of the intestine, sometimes causing both tenderness on pressure and a feeling of hardness in the part. This cause of course is to be removed by purgatives, and its recurrence prevented by all the means which tend to improve the abdominal secretions; and when the tendency has been of long standing, I think I have seen these means rendered both more effectual and more permanent, by blistering the tender part, which should be preceded, if the tenderness be considerable, by the local abstraction of blood.

The colon, like the stomach, is subject to thickening and induration of its coats. Where the disease had existed long, I have known it found, on dissection, indurated through almost its whole extent. Whether constipation or any of the other attendants on indigestion ever give rise to such affections, without the co-operation of other causes, may be doubted, the former being extremely common, and the latter very rare. Organic affections of the colon sometimes arise after obstinate fits of constipation; but whether these act as a cause, or are only among the first symptoms, it is difficult to determine. When a tendency to such affections exists, frequent constipation can hardly fail to increase it, and may be the means of calling it into action.

In some cases, as I have witnessed on dissection, although very rarely, the extension of the tenderness across the region of the stomach has been found to arise from a diseased state of the pancreas. The deep seat of the pancreas, and the little evidence we have of its function, make it very difficult to distinguish its diseases. It would not be easy to point out any means of distinguishing them, except when the organ is so indurated or enlarged, that its shape and position may be distinguished by the touch. Organic disease of this part, like that of the colon, is probably more frequently the cause than the consequence of the indigestion which attends it; although the symptoms are often so little modified, that the extension of the tenderness to the left side is often the only circumstance to

distinguish such cases from the more severe and obstinate forms of common indigestion.

Still more rarely the tenderness extends across the region of the stomach, in consequence of preternatural growths formed in that region.

Such are the principal causes which I have learned from dissection to be connected with a permanent tenderness, extending to the left side across the region of the stomach, in indigestion, and those cases so nearly resembling this disease, as to be mistaken for it, which the frequent habit of examining this region has enabled me to ascertain. There are doubtless others which occasionally produce this effect, but the great length of time during which I have had it in view to ascertain its causes, induces me to think that the foregoing are the chief of them. I speak of those cases which, less attentively considered, appear to be cases of common indigestion. There are, of course, other diseases in which this tenderness arises from other causes, but which are of a nature altogether different from that we are considering, and cannot be mistaken for it.

It sometimes, though rarely, happens in indigestion, that the abdominal muscles in the neighbourhood of the stomach become tender by sympathy; and this tenderness will sometimes spread to a considerable distance, both downwards and to the left side. It is in general, however, easily distinguished by the usual diagnostics of muscular pains, and can hardly be confounded with any of the preceding affections.

The reader will perceive that in all of these affections there is something more to be feared than in the more common form of the advanced stage of indigestion, in which the permanent tenderness never extends beyond the regions of the pylorus and first intestine. When it extends to the left side, which does not happen oftener than once in twenty or thirty cases, I always regard the disease as of a nature different from indigestion properly so called. Something is turning it out of its usual course, and the case, unless the extension of the tenderness towards the left side be transitory, will prove obstinate, if not serious.

The extension of the tenderness downwards, without any affection of the muscles, which is not uncommon in indigestion, either with or without its extension across the region of the

stomach, is much less to be feared than its extension across the region of the stomach alone. It is by no means uncommon, and indicates much less difference in the nature of the disease, appearing almost always to arise from the affection of the first intestine spreading to that in continuation with it. In this way it seems sometimes to pervade the whole of the intestines, but is for the most part readily relieved by local blood-letting, unless it has become habitual; and then, like the tenderness of the part first affected, it often continues for a great length of time, without serious consequences; but always attended with an infirm state of health and symptoms of indigestion, and sometimes with a great deal of suffering, and much general derangement. In a few cases, more serious consequences ensue, and particularly in children; I have known this symptom followed by effusion of water into the cavity of the abdomen. In such cases, we must suppose that the peritoneum partakes of the affection, and the case is of a nature essentially different from that of the common forms of indigestion, although the symptoms of the latter always constitute the most prominent part of the disease; and the treatment of the second stage of indigestion, combined, if a tendency to effusion has supervened, with the use of the more powerful diuretics, is, according to my experience, by far the most effectual plan of treatment: but here it is generally necessary to carry that plan to a greater extent than in cases of simple indigestion, particularly as respects local evacuations. It is not very uncommon for almost all the glands of the abdomen, particularly in children, to partake of the disease where the case is long protracted, and the habit unfavourable, and, under these circumstances, for the emaciation to become extreme. Thus mesenteric obstruction is sometimes the result, and, when proceeding from indigestion, belongs to the third stage of the disease, which we are soon more particularly to consider.

In proportion as the tenderness increases, from whatever cause, or occupies a larger space, the tightness of the pulse becomes more considerable. The state of the pulse, however, is not wanted as a measure of the tenderness. The examination by pressure renders any other superfluous; but the state of the pulse is not only the best, but, I believe I may say, the only certain, measure we possess of the general state of the se-

creting surfaces ; a point of the first importance in regulating the treatment of indigestion. Whatever may be supposed by those whose attention has been less particularly directed to it, a physician who has been accustomed to observe with care the changes of the pulse, and particularly to examine it in the way above pointed out, will know, without a risk of mistake, from its state, that of these surfaces, not only here, but in all other diseases. The state of the pulse corresponds as correctly with the failure of power in them, as it does with the state of an inflamed part ; but if we look for the same degree of tightness in both cases, and admit no pulse to be tight but that of active inflammation, we shall be disappointed, and, I have no hesitation in saying, deprived of the most correct means of judging of the general state of our patient in the more advanced stages of indigestion.

With respect to those who talk of the difficulty of distinguishing what they consider minute shades of difference in the pulse, I can assure them, that I have never met with one patient whom I have found it desirable to instruct in this respect, who did not in a short time acquire the power of distinguishing the different degrees of what I call a tight pulse, and who did not observe their connexion with the state of his feelings as well as the other symptoms of his disease.

#### *Of the State of the Organs of Waste in Indigestion.*

It very frequently happens, in the second stage of indigestion, that when the disease begins to yield, the patient gets thinner, whether he has been losing flesh previously or not, which arises from the organs of waste being the first to regain their due action ; for the function of those organs which throw off from the circulating fluids such parts, as have become useless for the purposes of the animal economy, is as necessary to health as that of the organs of supply.

The observations I am here about to make have little reference to the first stage ; it is then merely a local disease. The stomach alone, or along with the organs immediately connected with it, is affected. In the second stage, the whole system, to its remotest parts, partakes of the disease. The pulse is every where tight, and the secreting surfaces debilitated.

It is not uncommon, in the second stage of indigestion, for the organs of waste to be more debilitated than those of supply, and for the patient, from this cause, to become full and bloated. He acquires what, in common language, is called an unhealthy kind of fat. Part of what ought to be thrown off by the skin and other excretories is retained, and contributes not a little to the distressing feelings which he experiences. When this has happened to a considerable degree, the thinning is often rapid on the organs resuming their due functions; but even when this is not the case, the patient almost always becomes thinner in the first part of his recovery. As it advances, however, and the organs of supply begin to resume their proper functions, he begins to regain flesh, and by degrees returns to the standard natural to him in health, and thus generally becomes fuller than he has been during the greater part of his complaint. The loss of flesh without the loss of strength, in the early part of the treatment, I have found almost a certain sign of ultimate recovery. The thinning is a healthy process. It arises merely from the system now throwing off those parts of the blood which have become unfit for the purposes of the animal economy, and which ought sooner to have been discharged.

But when there is also a tendency to increased depression of strength at this period, much attention on the part of the practitioner is necessary; for if this amount to any considerable degree, and is any thing more than a transitory feeling, it will be found essentially to interfere with the progress of the cure. There is no point in the treatment of the more protracted cases of the second stage of indigestion which deserves more attention than this. I shall therefore inquire into the causes of this tendency to an increase of debility in the commencement of the proper plan of treatment, and the means necessary to obviate it.

It evidently arises from several causes, but I believe chiefly from the following. All causes of irritation tend more or less to excite a feverish state. Hence the tight pulse, and frequent occurrence of some feverish symptoms, particularly towards evening, in the second stage of indigestion. The tight pulse, indeed, which is always present in a greater or less degree at this period, constitutes itself a certain degree of feverishness, and,

when considerable, is accompanied with all its essential symptoms. The vessels, in consequence of the continued irritation of the most sensible nerves of our frame, are excited to embrace the blood more strongly than in health, the cause of the tightness of the pulse. Now this state, although a morbid one, tends for the present to support the strength, and we know, when in the extreme, will even give a preternatural degree of strength. I have several times been consulted by dyspeptics, who said that the most unaccountable peculiarity of their case was, that they never felt tired, but felt as if they could walk for ever. This, so contrary to what is usual in indigestion, arises from peculiarity of habit; but strikingly illustrates a point of great importance in the nature of the disease. In such patients, the nerves are so braced by the tightened circulation, as not only to obviate the usual debilitating effects of the disease, but even to give a preternatural vigour.

Could we suddenly relieve the dyspeptic from the causes of irritation to which he has been so long subject, by at once removing his disease, he would feel a depression of strength, till the nerves had accommodated themselves to the change. The tightened state of the circulation would be relaxed, and the effect of this would be increased by the secreting surfaces, which were bound up, beginning to form more freely from the blood their various fluids, and also by the alimentary canal being less distended with flatulence and a collection of undigested food, which, however injurious, for the time gives tension, and therefore tone. On the same principle, if the water be too suddenly drawn off in dropsy of the abdomen, even by a greatly-increased action of the kidneys, and still more by tapping, the patient feels an extreme sense of depression, and, in the latter case, often faints altogether. The pressure which braced both the circulating system and the nerves is taken off more suddenly than the system can accommodate itself to the change.

Thus it is, that even a change of diet from one of difficult to one of easy digestion, is sometimes attended with a considerable degree of depression, and that when no medicine is given, and more nourishment is actually received by the system, for what is not digested cannot nourish; so that even

this change, the most essential for a dyspeptic, must be made with some degree of caution in severe and protracted cases, and it should often be a work of considerable time to bring the patient to the proper diet.

If it is attempted too suddenly, he will tell you that his constitution cannot bear the diet you prescribe, and be discouraged from seconding your views, and, not unlikely, deprived of all chance of perfect recovery; for without a certain attention to rules of diet, the cure of indigestion, particularly when of long standing, is impossible. What means will remove a disease, the causes of which are being continually applied?

Another cause of the depression which is apt to attend the first employment of the proper means in the second stage of indigestion is, that it is impossible to relieve cases of long standing without some of those measures which more directly soften the pulse and relax the secreting surfaces.

To produce a soft skin and a natural pulse, in such cases, without which the patient can never be considered as cured, nor can he ever have the feelings of health, it is seldom sufficient to remove the causes of irritation. The bad habit is formed, and it must be corrected by such means as excite the secreting surfaces; in short, such means as take off the slight feverish state which prevails in the system\*, and more or less interferes with all its functions. Thus it is that alterative and saline medicines become necessary. But the reader will easily see why it is requisite, particularly at first, to employ them very cautiously; and this caution is doubly necessary, because the patient has generally been in the habit of using some of the stimulating means which constitute the appropriate treatment of the first stage; but, if of much power, generally add to the evil in the second.

\* It is not uncommon for the patient to say, that he has a constant inward fever; and when he is called upon to explain this expression, he says there is often a sense of heat internally, even when the surface is cold. We are too apt to trust to our previous knowledge, and disregard the observations of our patients, forgetting that all valuable knowledge, as far as relates to the practical part of our profession, is acquired by attending to the phenomena of disease; and that there are many of these phenomena, the knowledge of which we can acquire in no other way than by what the patient says.

The difference in the manner in which different individuals bear the changes necessary to recovery, in advanced states of the disease, is very remarkable. In some the habit may be quickly altered with but little depression of strength; while in others it requires all the attention of the physician to prevent a considerable degree of it—such is the difference of constitution. The treatment should be regulated accordingly, and any great degree of depression prevented. It is to be observed, however, that the greater part of this depression is not, properly speaking, actual debility, as the intelligent reader will perceive from what has just been said, and the observations made above on the nature of depression of strength compared with actual debility; the feelings of the patient, however, are, for the time, the same as if it were so.

The physician may overlook the essential change which takes place in the progress of indigestion, and constitutes the difference between what I have called the first and second stages; but it is impossible for the patient himself to overlook it. We constantly find dyspeptics declaring that the stimulants which used to relieve them seem now to do harm; and that they cannot continue their use for many days together, although the sense of depression which they feel on abstaining from them, still impels them to return to, and even to increase them, by which they never fail to aggravate the disease. They are taking a course exactly the reverse of the only one which leads to health.

In this dilemma it is common to recommend change of scene, a mild and nutritive diet, mineral waters, and no more medicine than the patient finds absolutely necessary; and there is a great deal of good in all this; but, in a very large majority of such cases, these means prove ineffectual. The cure is then said to be hopeless, and the patient is advised to use the means which his experience tells him suit him best, and make himself as comfortable as he can. The physician's mind is made up that the case is beyond the reach of our art, and consequently that nothing more is to be done for it.

In such cases a permanent cure can generally be effected by simply removing the tight pulse and bound state of the secreting surfaces, and by gradually weaning the patient from his stimulants, at first rejecting the more powerful, and combining

the milder with those means which, without acting as stimulants to the stomach, already too much stimulated, both by the disease and the means employed for its relief, excite the organs, to which the debility, originally confined to the stomach, has now spread, in consequence of which the system is neither receiving what it ought to receive, nor throwing off what it ought to get rid of; and thus the disease, in one of its most distressing and obstinate forms, prolonged.

When this necessary change of measures produces depression, the remedy is simply to make it by slower degrees, to make the dose of the alteratives extremely small, and to retain as much of the tonics as will not materially interfere with the only means of restoration. By a careful perseverance in such a plan, I have the satisfaction of being able to point out individuals restored to a state of health, who had laboured under the second stage of indigestion, even for fifteen or twenty years, and long abandoned all hope of recovery.

The depression in the commencement of the proper treatment of indigestion is still increased by another cause. The pleasures of the table generally form a greater proportion of the enjoyment of life than we are willing to acknowledge, and it is very disagreeable and consequently depressing to be restricted in them. A little time, however, generally convinces the patient that the solid advantages of a mind and body at ease, and capable of performing with satisfaction the various duties of life, greatly overbalance the feverish enjoyment of any gratification which materially interferes with them.

By taxing the digestive organs beyond their power, the function of every part becomes a burden to it. For here, as in every other instance, we still observe the sympathy of other parts of the system with the state of these organs. If they be irritated, every other part partakes of the irritation. If an inflammatory tendency be excited in them, in like manner every part partakes of this tendency; and if their function be oppressed, no other is readily performed.

The foregoing, then, are the chief causes of depression which operate in the commencement of the proper, and I believe the only effectual, treatment of the more advanced stages of indigestion. To recapitulate in a few words the heads of what has been said—such is the nature of indigestion, that, after it

has continued for some time, by the nervous irritation which attends it, it tightens and binds up, if I may use these expressions, the circulating and secreting systems. This state, while it torments with a thousand distressing feelings, gives a species of unhealthy vigour, which the patient resigns with reluctance, and which he should only be called upon to resign very gradually, and, as far as possible, only in proportion as a more healthy vigour is substituted for it. The means of effectual and permanent relief are all such as tend to relax the morbid constriction of the vital parts; but they must only be employed to an extent proportioned to the state and habit of the patient, and combined with as large a proportion of the tonic plan as can be borne without interfering with the essential parts of the treatment.

IN the preceding observations I have kept in view the usual, and what I would call the regular, course of the disease. I do not know that any attempt has hitherto been made to ascertain what its regular course is. Its symptoms are very various, and at first view nothing can be more irregular. When more carefully observed, however, it will be found to take a course as determinate as other diseases, except that it is more liable than most others to deviate from its usual course, because it is influenced by a greater number of causes, and, from its phenomena depending so much on the state of the nervous system, by causes of a slighter nature, and consequently more liable to escape observation.

But those who take the trouble to separate the essential from the accidental symptoms, that is, the symptoms which appear in all cases, and therefore constitute the disease, from those which, from peculiarity of habit, or other causes, appear only in particular cases, will find that, in the first instance, it consists of a deranged state of the function of the stomach alone; that the derangement gradually spreads to the function of the organs nearest to it, and with whose function that of the stomach is most intimately connected; and that at length, from the continued irritation of the nervous system, on which the function of every part more or less directly depends, it becomes an affection of the whole system; its nature changing in this

course from a disease of mere nervous irritation to one influencing the state of the vessels as well as the nerves, in consequence of which, like the effect of all other long continued nervous irritation, it assumes more or less of an inflammatory character.

They will also see clearly, that, however it may be modified in particular instances, this disease of the whole system is exactly of the same nature as other affections of the whole system arising from other causes of irritation; that is, that it is a state of fever, the only general disease in the strict sense of the word; a disease which admits of infinite variety, from a degree hardly perceptible, to that which destroys life.

In long-protracted nervous fever we sometimes find the functions only deviating a little from the healthy state. The patient, when he is still, feels very well; his appetite is moderate, he digests pretty well. The pulse is a little tight, but not more frequent, perhaps, than natural; the secreting surfaces are less free than usual, but their function is but little deranged. The patient is listless, less capable of exertion, perhaps subject to occasional fits of heat, particularly of the hands and feet, but can hardly be said to be ill, and wonders he does not get quite well. There is no physician who has not seen patients, in protracted cases of the milder forms of nervous fever, in such a state as is here described.

In what does this state differ from many cases of protracted indigestion, where the spreading of the disease to the whole system has, to a certain degree, relieved its original seat?

The states are the same, the difference is in the causes which produced them. But there is this material difference in their tendency. In the case of simple nervous fever there is no local weakness supporting the disease; and the various organs gradually, though slowly, resume their due functions. In the case of indigestion, the original weakness, though alleviated by the presence of the general disease, still exists, and is apt to be aggravated by slight causes, and even by the abatement of the general affection which has relieved it; and thus, if means are not used to strengthen the digestive organs, the state of general irritation may be kept up, till the structure of some organ, more inclined to disease than the rest, deviates

from the healthy state, and becomes permanently unfitted for its function.

Such I consider the regular course of the more protracted cases of indigestion, in the sense in which I use the term; but its symptoms, as I have just had occasion to observe, and, as is more or less the case with all diseases, are apt to be modified by accidental causes. On one of these modifications I shall here say a few words, because it is a very essential one, and particularly connected with the part of the subject we have just been considering,—the state of the organs of waste in this disease.

In all cases the tendency of fever is to bind up the surfaces; and when they are relaxed, the fever is usually relieved, or ceases: but it sometimes happens, in ordinary cases of fever, that the surface is relaxed and moist, without relieving the symptoms; the internal surfaces not partaking of the change. Something has taken the disease out of its usual course, and we generally find such cases obstinate.

Now, in the febrile stage of indigestion, if I may use the expression, we now and then meet with the same deviation from the usual course of the disease; and the skin, instead of being obstinately dry, its usual state at this period, is constantly moist, or ready to become so on every slight occasion, without any relief to the disease, while perhaps the mouth and other secreting surfaces are dryer than in the preceding stage. Cases of this kind, analogous to what happens in the more ordinary forms of fever, almost always prove obstinate. The disease, from some cause which it would be difficult to ascertain, in general, perhaps, peculiarity of constitution, is forced from its natural course. In such cases the pulse is generally feeble, though still always more or less contracted, if examined in the way I have pointed out; but less so than in the common form of the second stage; and the debility is generally great.

The intelligent reader will readily perceive the tendency of this deviation from the usual course of the disease, as respects the foregoing principles of treatment. It confines the practice, as far as regards the relaxing part of the treatment, and both renders the tonic part more necessary, and the patient more capable of bearing it. But it has neither of these effects to the degree which we might *à priori* be led to suppose.

A less free employment of the former set of means is still found of service, especially when the patient, as often happens, still has occasional fits of heat, and is generally necessary to enable him to bear any considerable degree of the tonic plan; and the frequent repetition of the minute dose of the mercurial, I have found by far the most powerful means of checking the debilitating sweats, which are always increased by every additional irritation of the digestive organs, and relieved by whatever promotes a more healthy action in them.

The practitioner will also generally be disappointed if he expects to find his patient bear tonics as well as the state of the skin alone would indicate. Some caution he will still find necessary in their employment. The relaxation of the skin, as has just been observed, does not always indicate general relaxation in this disease. The other surfaces are often still bound, and the particular state of the skin, as far as so general an affection can deserve the name, may be regarded as a local affection; rather as one of those anomalous symptoms which depend on peculiarity of constitution, than as indicating a change in the general nature of the disease; besides, it often happens, in such cases, that this relaxed state of the skin alternates with its usual dry and bound state.

In like manner, in indigestion, there is sometimes an habitually relaxed, instead of the usual constipated, state of the bowels. This is a more common deviation from the usual course, and influences less the general course of the disease; but, like the relaxed state of the skin, it is only favourable when it indicates a free and general action of all the secreting surfaces. When the bowels are relaxed, and the skin remains arid, as frequently happens in such cases, this state of them only adds to the disease. It is also distinguished from that which indicates a favourable change, by generally going to greater excess, and often proving obstinate.

#### *Of the Treatment in the more protracted Cases of Indigestion.*

THE great object here, as with respect to every other disease, is to arrive at general principles, without which our practice must always be vague; for every constitution having its peculiarities, it is often of little consequence to know what has been of use in particular instances. Thus it is that rules of

practice, which lead to no determinate principles, are generally of little value. After all that can be said, the practitioner still feels himself at a loss in attempting to apply them. It is a knowledge of these principles alone which constitutes the difference between the rational practitioner and mere empiric.

It appears, from what has been said, that when the symptoms of the second stage are well formed, the more permanent effect of stimulants always tends to do harm. They are proper only as a means of relieving the sense of depression, and because their use in the earlier part of the disease has formed a habit, which renders their continuance more or less necessary. As far, then, as the more temporary stimulants answer these purposes, they are to be preferred. Simple stimulants are preferable to what are called tonics, which excite less for the moment, but whose effects remain longer.

When we have succeeded, however, by means of the alterative plan, in relaxing to a certain degree the sanguiferous system and secreting surfaces, the more permanent effect of tonics again begins to be beneficial, and the relaxation of the surfaces, to which the patient has been so long unaccustomed, demands it. As there is a period in the progress of the disease at which the more permanent stimulants can no longer be borne, so there is a period in the progress of the recovery at which they may again be employed with advantage. They must now, however, be used with more caution than in the first stage of the disease; otherwise their tendency to renew the state, from which the patient is just relieved, generally soon shows itself.

These principles kept in view, together with attention to the peculiarities of the patient's habit, will generally, in the more protracted as well as more recent cases, point out what is best to be done; for which no general rule can be laid down, except that in the former, still more than in the latter cases, our practice should lean as much to the tonic plan as the nature of the case admits of.

They lead us, in the first instance, except where the febrile tendency is great, to combine the lighter bitters, as camomile and orange-peel, the warmer gums, and the preparations of ammonia, with the appropriate treatment of the second stage, taking care to keep within the limit at which they show a tendency to produce oppression or morbid heat of the skin; and

it is not very uncommon, in cases of long continuance, to be obliged to lay aside every medicine of this kind, even camomile-tea, the least stimulating of all.

As the surfaces become more relaxed, we find the patient can bear the mineral acids, iron, and even the bark, of which the sulphate of quinine is the best preparation, according to the circumstances of his case and constitution. But, even here, if these or any other tonics are found to produce dryness of skin, any sensible increase in the tightness of pulse, increased heat, a sense of oppression, either general or referred to the stomach, or, in short, any considerable degree of those symptoms which characterize the second stage of indigestion, the dose must be lessened, and, if these effects cannot otherwise be controlled, they must be laid aside. Of these means the acids can most frequently be borne; next to them the preparations of iron, and least frequently the bark, although, where it can be borne, it is the most effectual. The patient generally bears the tonic well for a few days, for it requires a certain time for it to produce its effect in tightening the pulse and secreting surfaces; and thus some advantage may be gained by the temporary use of tonics when their permanent use cannot be borne. This employment of them requires great attention on the part of the practitioner, and much advantage is seldom gained by it, except where the debility is urgent.

The early use of tonics, it has already been observed, is more called for, and generally more admissible, in the cases in which the usual course of the disease is disturbed, and the debility of the surface appears in a relaxed, rather than a constricted state.

I have found no other tonic so useful, where the skin is habitually relaxed in indigestion, as the sulphuric acid. In general, indeed, in this disease, I have found it a most valuable medicine, on first returning to a more tonic plan—where the more urgent symptoms of the second stage begin to yield, but the patient is not yet able to bear more powerful tonics. This is analogous to what we observe of this medicine in fever, when the stage of excitement begins to be changed into that of depression—when we have obtained an imperfect relaxation of the secreting surfaces, but the habit of the fever is not yet subdued. The sulphuric acid does not seem to possess the same alterative power as the muriatic and nitric acids; but I

have no hesitation in saying, that, for the purpose here pointed out, it is superior to either of them.

In the use of all such means, in the second stage of indigestion, a free state of the bowels is essential. After the symptoms peculiar to this stage have been nearly removed, the best effects often arise from the preparations of iron combined with mild aperients, the alteratives being used at intervals of shorter duration in proportion to the tendency to relapse.

When the tonic power of the bark cannot be borne, some of the other tonic bitters may be employed. Calumba and gentian I have found the best; but we are often obliged to lay aside all this class, and confine ourselves to the more simple bitters above enumerated; and even these, we have seen, cannot in all cases be borne although guarded by saline and purgative medicines. They must, then, be abandoned, and we must be content to render the anti-inflammatory measures as mild as the nature of the case admits of, and support the strength by the effect of the more transitory stimulants. The pulse must be softened by a mild diet, and medicines which excite the secreting surfaces with little call on the strength. The moderate use of saline medicines, with minute doses of the mildest mercurial, more or less regularly employed, according to the circumstances of the case, occasionally combined with ammonia and aromatics, is the most effectual plan. A diet composed wholly of vegetable substances, and milk more or less diluted, when the stomach can bear such a diet, with small doses of saline medicines, often produces an effect that would surprise any one not accustomed to see those labouring under this form of the disease; who have been vainly endeavouring to support their strength by a large proportion of animal food and tonic medicines. It has long been admitted, indeed, that such a diet is sometimes useful in cases of debility. By this change, the pulse is more or less softened, and the bowels and the skin are relaxed.

It generally happens, however, that the debility is such that some portion of animal food is necessary, and a diet wholly composed of vegetable matter (the farinaceous, of course, is the best) is often apt to increase the symptoms of indigestion. More or less animal food, therefore, is generally necessary; but even here I have often seen the best effects from occasionally abstaining from it.

Considerable advantage has sometimes appeared to arise, in the case before us, from sarsaparilla when the stomach bore it well \*. Its continued use seems to give a general tendency to greater freedom in the secreting surfaces. I have known sarsaparilla act as a sudorific, in a state of great debility, to such a degree as to make it necessary to abstain from it; the sweats constantly recurring on its employment being resumed, a circumstance which sufficiently evinces its power over the skin. I shall have occasion to make some additional observations on the means of relaxing the surfaces in such cases, in speaking more particularly of the effect of nitrate of potash and tartarized antimony.

We may infer, from what was said of the effect of a close and damp air in speaking of the causes of indigestion, that a clear and dry air, if the dryness be not in the extreme, is often of the greatest use to the dyspeptic, and the states we are now considering require it more than those of an earlier period.

A very sharp air, however, is unfavourable. It too much promotes the inflammatory tendency, and all sudden changes of weather, on this account, are injurious. It is thus that the spring is the most unfavourable season for dyspeptics; but a heavy, still air never fails to depress their spirits and increase the whole train of nervous symptoms.

I have often, during a long residence in a town where the air is too close, both from its low situation and the flat and wooded state of the country, seen these observations strikingly illustrated. Patients of this description drooped in the town, but, on being removed to the neighbouring hills of Malvern, immediately revived; and those who at Malvern enjoyed good health were often affected with nervous and bilious complaints on coming to the closer air.

On the whole, a free but not sharp air, a mild and digestible diet, regular exercise proportioned to the strength, a regular state of the bowels, an alterative in doses extremely small, but frequently repeated, with an occasional dose of calomel when

\* The infusion of sarsaparilla made with lime-water, first, I believe, proposed by Mr. Batley, or with liquor potassæ in the proportion of about a drachm to a pint of water, appears to be both more effectual and much lighter on the stomach than the decoction. The powder, if in preparing it the tough woody part be as much as possible excluded, is perhaps the best preparation of sarsaparilla, when the stomach will bear it.

more accumulation than usual has taken place, a moderate use of saline medicines, particularly at the times when the general temperature is increased, or there is a sensation of burning in the hands and feet, and the use of sarsaparilla when it does not oppress the stomach, and such other medicines as excite the secreting surfaces generally, without materially impairing the strength, I would say, constitute, according to my experience, the outlines of the best plan in such cases; and I believe mischief is always done by powerful measures, whether evacuants or tonics. It is necessary to make the patient sufficiently acquainted with his case to be satisfied with gradual amendment.

When other means fail, change of place, particularly in the form of the disease which makes the principal subject of the following Chapter, and still more, a voyage and change of climate are often of service; and the water of Malvern, which is an extremely slight alkaline chalybeate\*, and that of Harrowgate, Buxton, and of the Spa, Carlsbad, and some other mineral waters of the Continent, are often useful.

In most dyspeptic cases, where the strength is considerable, temporary relief is generally obtained from Cheltenham and Leamington; but, of some hundreds of the confirmed dyspeptics of this country who have had recourse to them, I have not seen one permanently cured by them, although they often aid the permanent cure by bringing the patient into a state to be more benefited by other means. To those who come from sultry climates with sound constitutions, but gorged, not diseased, livers, they are often of permanent use. In these cases the origin of the disease is in the liver, not the stomach. They are not cases of indigestion, such as it appears in this country.

As many of the more protracted cases of indigestion have seldom been accurately distinguished, their treatment must be regarded as in its infancy. They are sometimes treated merely as cases of obstinate general debility, and thus, by the tonic means employed, the lurking inflammatory tendency is called into action; and often, at length, shows itself by some of the trains of symptoms which have been considered in the last

\* My Analysis of the Malvern Water, and the Medical Repository, vol. xv., p. 285, *et seq.*

section of the preceding chapter ; which, if frequently renewed, end in change of structure.

It sometimes, though rarely, happens, that those who have long been accustomed to a certain degree of tightness in the pulse, cannot, even for years, be brought to bear one as soft as the perfectly healthy pulse ; all the means which produce such a pulse occasioning in them a considerable degree of depression, often such as unfits them for the active duties of life ; yet they are capable of most of those duties, and, on the whole, enjoy a tolerable share of health, if some degree of tightness be allowed to remain in the pulse.

In such cases I have found it the best plan only occasionally to have recourse to medicine, when the symptoms have been accidentally aggravated, and in general to trust to a proper diet, a regular state of the bowels, and such exercise in the open air as the patient's strength and feelings admit of ; for much exercise is often prevented, as much by the uneasy feelings it excites, as by actual debility.

It is often very easy in these cases wholly to remove the tightness of pulse, by any of the means which excite the vessels of the surface, and sometimes even by rendering the diet less stimulating ; but the relief thus obtained is not proportioned to the sense of depression which the perfectly soft pulse causes, to which the system accommodates itself with greater difficulty than usual. By slow degrees, however, it is at length brought to do so, and then the cure is completed. I have never seen this state, except in those in whom the disease had continued for many years, and it by no means occurs in most of them. In general the patient can, in the course of a few months, be brought to bear a perfectly soft pulse ; and the cure requires, for its continuance, only a degree of caution, which, in proportion as the habit of health is established, may in most cases, in a great degree, be very gradually dispensed with.

It appears, from many of the preceding observations, that not only in these, but in the more ordinary cases of protracted indigestion, the completion of the cure depends much on the management of the patient after the more urgent symptoms

have been subdued; and that, in order to restore him to a state of permanent health, some return to the tonic plan of treatment is generally necessary. Many suffer relapses, or remain long in a debilitated state, in consequence of this part of the treatment being neglected. The patient, perhaps, has left the neighbourhood of the physician, or, feeling himself relieved from the more urgent symptoms, thinks it unnecessary to apply to him, and he often has a horror for tonic medicines, the bad effects of which he has experienced, and would soon again experience, were they incautiously administered. Some habits are sufficiently vigorous, on the removal of the symptoms peculiar to the second stage, particularly when it has not been of very long duration, not to require such medicines; and some, so irritable and so disposed to a recurrence of these symptoms, as not to bear even their most guarded use.

We have seen that, as the symptoms which constitute the second stage of the disease become established, the original symptoms often become milder, and sometimes almost disappear. It is remarkable, on the other hand, that, in the progress of the cure, as the former are relieved, the latter are apt to increase or return. The patient often remarks that, although he is so much better in his general health, he is more troubled with his old stomach complaints than he had been for a long time, and feels himself more incommoded by errors of diet than when he was so ill. This observation requires all the physician's attention; for if these warnings be neglected, the first stage will again be established, and, as I know from repeated experience, much more readily, than in the first instance, changed into the second.

The strictest attention to diet and exercise, caution in the use of tonics, and occasional mild alterative doses to protect against a recurrence of this stage, even where the bile appears but little if at all deranged, constitute the proper treatment. It is only in the more obstinate cases that this recurrence of the first stage is observed in any remarkable degree. The sufferer must then learn to be both patient and circumspect, if he wishes to be restored to anything like permanent health. In such cases the disease lingers, either in consequence of the effect of long habit, or of an unusual want of vigour in certain parts of the constitution.

Indigestion sometimes proves obstinate in another way, still more distressing. In general the good effects of the proper plan of treatment in the second stage are soon perceived, sometimes in a few days, and, for the most part, within a week or ten days; but in some cases of long standing the disease proves more obstinate, and although the patient generally experiences some amendment, it is not such as to induce him to persevere in the plan of treatment. Some patients of this description, after having again recurred to other plans, and experienced their inefficacy, have been induced to listen to the hopes of relief held out to them by longer perseverance in the foregoing means; and even where these had been employed for months without decided amendment, this amendment has at length come, and has not been less than in cases where it came more quickly. Such cases, several of which I could at this moment point out, have convinced me that, even in the most obstinate, there are no means of relief, when the disease has arrived at the second stage, but those of exciting the secreting surfaces, and thus restoring the proper balance of circulation; and that, in the cases which at first appear the most hopeless, this may often at length be effected. Experience has taught me to despair of no case where the affection of the digestive organs is the original disease, in which change of structure in a vital part has not made some progress; and it luckily happens that the parts chiefly concerned in indigestion may have their functions seriously disordered for a great length of time, without any change of this kind taking place in them. In distinguishing such cases, however, the practitioner will frequently be led into error, if he does not attend to what is said in the following chapter respecting symptomatic indigestion.

THERE are three medicines, the importance of which, especially of the first and last, is so great in the treatment of indigestion, that a few additional observations on their employment particularly applicable to protracted cases are here called for, and the more so, that none of them have been very generally, and the first I believe not at all, employed in that disease; I mean nitrate of potash, tartarized antimony, and ammonia.

*Of the Nitrate of Potash.*

SOME saline medicine I consider essential in the second stage of indigestion, for reasons which have already been pointed out; and I have found none so beneficial as the nitrate of potash. I feel no hesitation in saying, on the one hand, that it enables us at this period to lessen the quantity of mercury, and on the other, that increasing the quantity of the latter will by no means produce the good effect of combining it with this nitrate, to say nothing of the greater tendency of mercury to impair the strength.

The nitrate of potash is chiefly indicated when there is a tendency to an increase of heat in the evening, or during the night, and particularly to a burning in the hands and feet; and in such cases its good effects are both greatest and most quickly apparent; but they are not confined to such cases. When there is no increase of heat, and even when the temperature is below the healthy standard, if this be not the case in a considerable degree, I still find this medicine to add to the good effects of the alterative course, provided there is an evident tightness of pulse, when examined in the way above pointed out; but in such cases it is generally proper to combine it with some warm medicine. Ammonia and small doses of the more stimulating, but less permanently heating, tinctures, are those I have generally employed.

When I first made trial of this combination, I doubted whether the good effects of the salt would not be wholly counteracted by the warm medicines; but I soon found that this is by no means the case, and that the advantage derived from the former, as an alterative, is very little interfered with by the latter. Here, it is true, we do not, in the same degree, obtain the cooling effect of the salt; it is combined with the foregoing medicines, amongst other reasons, to prevent too much of this effect. It is its effect on the vessels of the digestive organs, and on the extreme vessels in general, that is wanted, and which appears to be little, if at all, impaired by this addition.

It is generally, not always, as might be supposed in those cases where the surface is most inclined to be cold, that the patient is most subject to depression of strength and spirits. Here warm medicines are doubly indicated, and the occasional

use of ammonia, even in considerable doses, I have found very beneficial, and very little liable to interfere with the alterative effect of the nitrate. The effect of the latter, however, sometimes materially interferes with its effect. I have seen some in whom the languor of circulation and coldness of habit were such, that the chilling effect of the nitrate could not be counteracted by any stimulus it would be proper to employ. In such cases the nitrate must be abandoned. They are, however, comparatively rare.

In a still smaller number, from idiosyncrasy of constitution, even very small doses of this salt cannot be borne, apparently from the irritation of the stomach and bowels which they occasion; and I have met with cases in which none of the salts, into the composition of which potash enters, could be borne. In cases where the stomach is unusually sensible to the irritation of the nitrate, the common saline draught is a good substitute. The potash is preferable to the soda in their composition, if the stomach bears it equally well.

Although the cases in which it is necessary to abandon the nitrate of potash are rare, it is not very uncommon to be obliged to give it in small doses—five or six grains. It should never be given in such doses as very sensibly to add to the depression. I seldom give it in doses exceeding ten or twelve grains. Such in general is the effect of this medicine, in the second stage of indigestion, particularly in the more protracted cases, that it is not at all uncommon for patients, guided merely by their own feelings, to continue the use of it after they have gradually laid aside all others, and to declare that they derive from it a kind of relief which they never experienced from any other means. This has not been the observation of one or two, but of a large proportion of those who have used it. Yet nobody would think of giving nitrate of potash in the commencement of indigestion; and it is not even mentioned in the catalogue of stomachic medicines. Can any opinions be brought in opposition to these, and many similar facts, to which I have had occasion to refer, tending to establish the same position; that the nature of this disease is changed in its progress, and requires in its different stages very different, and even opposite, plans of cure? Those who maintain such opinions have a very imperfect knowledge of indigestion. Their

knowledge of it has never gone beyond the first stage ; from which their views of its nature, as well as plans of treatment, are derived.

I have found the good effects of nitrate of potash sensibly increased, by combining with it a small quantity of mucilage, and a very slight anodyne. From six to twelve minims of tincture of hyosciamus, or a combination of two or three drops of laudanum with four or five of wine of ipecacuanha, I have found the best anodyne. These doses will only appear trifling to those who have not attentively watched the symptoms of indigestion, in the more advanced stages of which the nerves, from repeated irritation, often acquire a sensibility which appears almost incredible. The gums are among the least sensible parts of our frame, but those who have been troubled with carious teeth, know how exquisitely sensible they may be rendered by irritation of long continuance. Is it surprising then that the most sensible parts of our body should experience a similar change ?

I have had occasion to observe, that indigestion attends, and, I might have said, lays the foundation of most of the diseases of infancy ; and to remark, that the duration of the first stage of indigestion is very various, the symptoms of the second stage showing themselves at various periods in different cases. In children, those of the second stage supervene very early, and the disease in them often appears to commence in the liver rather than the stomach, the latter suffering only secondarily, which is the reverse of what usually happens in the adult, at least in this country. It is the early supervention of the second stage which renders saline medicines so essential in the diseases of children.

If the disease has made any considerable progress in them, no course of mercurials, or any other means, will succeed well without saline medicines ; and I have found the nitrate of potash invaluable in most of their diseases. Their nerves, as well as vessels, are more irritable than those of the adult. It is on this account that in them the more advanced stages of indigestion, the progress of which we have seen so essentially depends on the state of the nervous system, supervene more readily, and are attended with more fever, and more apt to

produce serious derangement. Continued irritation of the digestive organs, which in the adult produces a tight pulse, and often a tendency to increased heat, in them produces actual fever, which is only a greater degree of the same symptoms.

Such is the nature of what has been called the remitting fever of children, which is so apt, when neglected, to end in effusion of water in the brain, the part in children most liable to suffer from the general irritation kept up by a deranged state of the digestive organs.

### *Of Tartarized Antimony.*

TARTARIZED antimony is proper in many of the same cases in which nitrate of potash is so beneficial ; but it is a medicine of very different properties, and the principles which regulate its employment are very different. It appears, from experiments which the College of Physicians did me the honour to publish in the last volume of their Transactions, that, of all the means that were tried, tartarized antimony had the greatest effect in suddenly exciting the action of the skin. It has comparatively little effect in exciting sensible perspiration ; but, as appears from these experiments, as well as many other circumstances, it is not by sensible perspiration, but by a free state of the insensible action of the skin, that its vigour is indicated.

When the reader considers what has been said respecting the state of the skin in indigestion, he will be prepared for the good effect of such a medicine in the more protracted cases of this disease. I have had many patients who told me that they could always secure a good day by exciting sensible perspiration in the morning. This, for a reason just mentioned, and others above stated, should not be our aim in indigestion ; but it is more favourable than the arid state of the dyspeptic's skin, and affords temporary relief.

When the surface is dry, and the tendency to feverish attacks considerable, and we have reason to believe that the disease is, in a great measure, supported by the general state of the secreting surfaces, the tartarized antimony, as might *à priori* be expected, is often a valuable medicine ; and I was agreeably disappointed to find that doses so minute as neither

to excite nausea, nor any increased sense of debility, are often sufficient to produce a sensible improvement. A slight degree of nausea, if it be only occasional, I have found of little importance, and, contrary to what might be expected, it seldom even impairs the appetite. The antimonial has always been laid aside when it has appeared to increase the sense of sinking. The dose I have employed has generally been from the tenth to the eighth part of a grain, three or four times a day. I have never seen the least bad effect from such doses, even when continued for months; and the patient, when they were laid aside, missing their good effects, has often requested to be allowed to resume them.

Analogous to what takes place in fever, when the tendency to increased heat is greater than usual, it has been found particularly serviceable, combined with the nitrate of potash. But of all the cases in which it was employed, it was found most beneficial in those where the dry skin and debilitated state of the other excretories had produced a determination of blood to the head; and it has been found necessary to continue it in such cases, after all other medicines had been laid aside.

Even in the early periods of the disease, great advantage is often derived from combining small doses of tartarized antimony with purgatives. It frequently has an operation on the bowels analogous to its effect on the skin, relaxing the surface, and thus rendering the action of purgatives more free. The same observation, indeed, applies more or less to all the secreting surfaces. In this respect its operation resembles that of mercury, but it produces its effects more quickly, and they are not, as in the case of the latter, apt to accumulate in the constitution; which makes it a less powerful medicine, but, under certain circumstances, increases its utility. It may sometimes, with great advantage, be substituted for mercury, and very often combined with it, for the purpose of rendering less mercury necessary.

The beneficial effects of antimony, in cutaneous affections, has long been acknowledged; when indigestion produces such affections, therefore, it is doubly indicated.

The operation of the colchicum is in many respects analogous to that of antimony; I have often used it, in very minute doses, for the purpose of relaxing the skin, and soften-

ing the pulse, in the advanced stages of indigestion. It was not among the medicines whose effects were compared with those of tartarized antimony, in the experiments just referred to; I cannot, therefore, say whether on the whole it may be equal to that medicine in promoting the action of the skin. In some respects it bears the same relation to antimony that this medicine does to mercury. Its effects are more sudden and more transitory; but it is capable of more violent effects than either of those medicines, and must always be used with caution, except in small doses, which are quite innocent.

The colchicum often has a peculiar effect in relieving the local inflammatory affections, so apt to supervene in protracted cases of indigestion, particularly those of the head and chest, and rheumatic pains of the muscles. I have often been disappointed in this effect of the colchicum before evacuations, and sometimes seen it act like a charm after them. When employed only with a view to relax the pulse and excretories, I have used it in very small doses; in rather larger doses with a view to relieve cough and pain; but always lessened the dose, if it produced more than a very gentle action on the bowels, or a decided softness of the skin.

In the second stage of indigestion, whatever plan is adopted, much depends on the gentleness of the effect produced. I have long been convinced that this state, particularly when it has continued long, is only to be relieved by a very gentle effect regularly kept up for a considerable length of time. All powerful means, the effects of which are necessarily transitory, because they would destroy the patient if they were continued, fail to cure, and very often aggravate it.

In the first stage, when the strength is unimpaired, and the habit of the disease feeble, powerful means will sometimes at once check its progress. In the second stage, where the opposites of these conditions obtain, this never happens. It is by the most gentle and frequently repeated impressions that the organs are solicited once more to resume their healthy action.

From what has just been said of the effects of the colchicum, compared with those of antimony, the reader will perceive that the former is, on the whole, less suited to the second stage of indigestion than the antimony; although its more speedy operation, its peculiar effect in relieving the inflammatory ten-

dency, and particularly the power it sometimes evinces of allaying pain and cough, renders it preferable under certain circumstances.

The effect of tartarized antimony in severe nervous agitation is sometimes very remarkable. Its power, even in allaying the symptoms of mania itself, is well known. I have often found rather larger doses than those just mentioned, combined with moderate doses of hyosciamus, powerful means of allaying the more severe forms of nervous irritation which now and then appear in protracted cases of indigestion; not depending on any local irritation, the seat of which the patient can point out, but on the state induced by long continued irritation of the general source of nervous power. The medicine we are next to consider has also a very powerful influence on the nervous system, but in a different way.

### *Of Ammonia.*

THE effects of ammonia in certain states of indigestion are very valuable, and such as cannot be produced by any other means. We have no other means which so powerfully excite the nerves with so little disturbance to other parts of the system. My attention was called to it above twenty years ago, by the essential benefit derived from very large doses of it, in a case which had resisted all the usual means.

In some protracted cases of indigestion, with the contracted pulse of the second stage, the vital fluids seem, as it were, to leave the surface, which is obstinately cold. The pulse, in such cases, is always small and tight, and the patient, for the most part, complains of great oppression, hangs over the fire, and says, that no exercise he can take has the effect of warming him. The nerves here are failing in one of their essential functions,—that of supporting, by their action on the blood, the due degree of animal temperature; for in all such cases the temperature of the surface, measured by the thermometer, is actually, and sometimes considerably, below that of health. Here the ammonia is invaluable, being less apt, than any other stimulus of the same power with respect to the nerves, to excite the heart and blood-vessels; which from the tendency of the disease, are inclined to a degree of excitement beyond that in due proportion to the state of the other powers. Their action is

less free than in health, and consequently less effectual in promoting the circulation; but the continual nervous irritation which attends the disease, and the retention of much which ought to have been excreted, excite them to embrace their contents too forcibly.

The carbonate of ammonia may be taken in doses of from five to ten grains several times a day with safety, and probably in larger quantity; and it rarely fails, if given in the proper dose, with such exercise as the patient can bear, to diffuse warmth throughout the system. Nor is the benefit derived from it of a mere transitory nature. A state of chill tends not only to aggravate all the symptoms, but to confirm the disease. I have even known the digestion constantly deranged by the temperature of the room being so low as to cause a feeling of chilliness.

Ammonia is also a valuable medicine in most of the nervous affections which attend indigestion, even when the patient is not particularly chilly, provided the nerves are so far languid in the function of preserving the temperature, as to allow of its being taken in considerable quantity, without heating too much; an inconvenience which attends the free use of it in most cases of the second stage of the disease.

I have little doubt that, to the tendency of ammonia to excite the skin, we must in part ascribe its good effects in indigestion. A combination of ammonia, ipecacuanha, and hyosciamus, is often a powerful means of relief in the nervous irritation of indigestion, accompanied with much sense of sinking and debility. It is probably chiefly to its effect on the skin that we ought to ascribe the advantage derived from some of its preparations, particularly the liquor ammoniæ acetatis, in the second stage of indigestion; in which I have repeatedly seen it eminently serviceable, when the ammonia itself heated too much. Nothing, in this stage of indigestion, more requires the attention of the physician than adapting the tendency of the treatment, to heat or cool, to the circumstances of his patient. If we here attempt to lay down any general rule, we shall be led into error. The peculiar circumstances of the disease, or constitution, for reasons which we cannot always detect, bear the one or other tendency better in one case than in another. The state of the pulse, and the effect of the means

employed, are our best guides ; and on our forming a correct judgment in this respect, both the comfort of our patient, and his final recovery, greatly depend.

These observations we have seen are as applicable to diet as medicine. I have already observed that there are cases of the second stage of indigestion, in which an abstinence from animal food is proper ; such cases, however, are rare. But when the pulse is obstinately tight, abstaining from it two days in the week, I have sometimes found to produce an effect which it is impossible to procure by any other means. The patient has felt himself almost immediately more at ease. The bowels in particular have become less irritable, and more obedient to medicine ; the skin softer, and the countenance much improved, and the ammonia, or other stimulants of the nervous system, better borne. The patient is often so pleased with the effect, that he thinks he has found a sovereign remedy for all his complaints. Let a dyspeptic, whose pulse has not acquired the same degree of tightness, and whose skin consequently is softer, follow the same plan, and it will do little more than add to the debility, and increase the flatulence both of the stomach and bowels. On the other hand, the stimulant, which the latter will tell you saves him from despair, given to the former will hardly fail to increase all his sufferings, and yet, to a superficial observer, these two patients are much in the same state. They both complain of depression of mind and body, and those thousand nameless symptoms which attend irritation of the nerves of the stomach and bowels, rendered doubly sensible by the continuance of the irritation. In the pulse we find the certain means of distinguishing them.

I SHALL close this part of the Treatise with one example of the appearances, on dissection, in a case of protracted indigestion. The account is in the words of Mr. Jeaffreson of Islington, the surgeon who made the examination. I had had opportunities of seeing the subject of this case, a lady between forty and fifty, from time to time during several years. It affords a good illustration of much of what has been said in the preceding part of this treatise ; and many similar instances might have been added. The patient had been absent for some months, during which the head had become greatly

affected, and returned in such a state that she only survived about a fortnight.

“The skull was remarkably thin, in most places not thicker than a shilling; the coverings of the brain very turgid with blood, you would rarely see them more so in a complete case of apoplexy, with a deposition of serum and coagulable lymph between the arachnoid and pia mater, which was equally vascular with the dura mater. The substance of the brain itself was very firm, and much more vascular than natural; there was rather more water in the ventricles than usual, but no great quantity.

“The lungs were very unhealthy on both sides, being studded with small tubercles, many in a state of suppuration, and others approaching to it: in the heart there was nothing remarkable, perhaps rather paler than natural.

“The liver remarkably firm in texture, and rather paler than natural, but no very morbid appearance in it; the gall-bladder rather larger than natural, and distended with thick viscid bile, and containing fourteen gall-stones, bigger considerably than so many large peas; there did not appear to be any of them in any of the ducts. The stomach was rather smaller than natural, the coats of which were much thickened, the internal, or villous, so firm that it could not be easily torn; the pyloric extremity showed more vascularity, as if from the effect of recent inflammatory action; and it adhered for a considerable extent to the diaphragm and left lobe of the liver. There was nothing particular throughout the remainder of the alimentary canal. The spleen larger than natural; the bladder much distended, but no disease; the uterus remarkably firm, so as to give a cartilaginous feel upon cutting into it; the os uteri very vascular, with a small polypous excrescence from the neck.”

This lady had only laboured under the symptoms of severe indigestion, with occasional symptoms, as frequently happens in such cases, indicating a determination, sometimes to one part, sometimes to another, those of the head latterly increasing, till its affection became the prominent disease. We here see exemplified in a remarkable degree, that general inflammatory state of the habit produced by long-continued indigestion. In the lungs tubercles had formed, some even had suppured, al-

though the disease had never appeared in them in a very active form. An inflammatory state of the pylorus and left lobe of the liver had evidently existed, from their adhesion and the adhesion of the former to the diaphragm; and the firmer texture of the liver showed that a disorganizing process had been going on throughout the whole of this viscus. Its inflammatory state had abated as the disease fixed more particularly on the brain. The state of the stomach itself, particularly of the pyloric end, was highly characteristic of long-continued indigestion; and in others of the abdominal viscera, traces of gradual disorganization, and, in the uterus, of inflammation also, were conspicuous. This case illustrates in a striking manner what I have had occasion to say of the general disorganizing as well as inflammatory tendency of the irritation of the nerves arising from protracted indigestion, which at length, from some occasional cause or greater proneness to disease, fixing on an essential organ, so affects its structure, as to render it incapable of the functions of life.

The principles of the treatment in the second stage of indigestion acquire no small degree of importance when it is considered, as appears from all that has been said, that it is often both the cause and attendant of the most formidable diseases; and that its treatment constitutes an essential, and sometimes the most essential, part of the means of cure in them: positions which will be fully illustrated by the observations in the sixth Chapter of this part, and those I shall have occasion to make on what may be regarded as the third and last stage of indigestion.

## CHAPTER V.

### *Of Symptomatic Indigestion.*

IN the observations I have had occasion to make on the phenomena, causes, and treatment of Indigestion, it has, with few exceptions, been regarded as the original disease. Like all other diseases, however, it is sometimes a secondary affection, the consequence of disease of other parts.

In many cases, nothing is more easy than to distinguish

symptomatic from original indigestion. In affections of the rectum and bladder, for example, we have indigestion depending on these affections, and not to be permanently cured but by their removal. On the nature and treatment of indigestion depending on the state of the uterus, I have already had occasion to make some observations. There is, however, a species of symptomatic indigestion which is often distinguished from the original disease, particularly in its more protracted forms, with great difficulty, and which, if confounded with it, leads to errors both in the prognosis and treatment.

As the function of the stomach depends on the nervous power, the formation of the gastric fluid, by which the solution of the food is effected, being immediately arrested on depriving the stomach of that power\*; and disorder of the stomach, on the other hand, always greatly affects the nervous system; it is quite evident that, in the case presented to us, in which the failure of the function of the stomach is combined with various affections of that system, the debility of the stomach may either have arisen from the state of the nervous system, or been the cause of it. On the determination of this question, which often requires a good deal of attention, the nature of the case, as well as the proper plan of treatment, greatly depends.

If it appear that the nervous affections have arisen wholly from the state of the digestive organs, and that no organic disease is established, we may be assured that, in nineteen cases out of twenty, however protracted the disease may have been, it is curable. The due function of the digestive organs may be restored, and then the various nervous affections which have arisen from the irritation of their nerves, will disappear.

If, on the contrary, the affection of the nervous system has been the primary disease, and that of the digestive organs merely its consequence, the case, though at first view similar, is of a very different nature; and the means successful in the former instance will here, however they may afford temporary relief, which is always more or less imperfect, eventually fail,

\* *Inquiry into the Laws of the Vital Functions*, chaps. v. and xi., 3rd edit. Philosophical Transactions for 1829.

unless we can remove the original cause of the disease. If they are laid aside, the symptoms soon increase; if they are long continued, they first fail to relieve, and at length become an additional cause of irritation. The chance of cure in such a case depends, therefore, on the nature of the nervous affection which causes it; and we have to lament that primary affections of the nervous system are generally of an obstinate nature, and sometimes hardly at all under the power of medicine. It luckily happens, however, that, in indigestion, for once that the original cause is in the nervous system, it is at least twenty times in the digestive organs themselves.

Notwithstanding the difference of their nature, so similar are these cases, particularly in the more protracted forms of the disease, that, unless there is some evident disease of the nervous system, they are generally regarded as the same, and consequently treated in the same way.

The most striking and certain means of distinguishing them is, that when the disease originates in the nervous system, the tenderness in the region of the pylorus, distention of the duodenum, and tightness of pulse, are less, compared with the severity of the nervous symptoms, than when the stomach is its original seat.

The diagnosis is assisted by the nature and course of the nervous symptoms themselves; for however various in different individuals, those arising from irritation of the digestive organs are, they do not in all respects resemble such as originate in the nervous system itself, although the difficulty of distinguishing them is increased by the latter being more or less complicated with those caused by the state of the digestive organs, induced by the nervous affection.

The nervous symptoms in the latter case, however, are on the whole less influenced by the state of those organs, than when the disease originates in them. They are less aggravated by causes oppressing the digestive organs, and less relieved by removing the causes of oppression; and, on the other hand, they are more influenced by causes not immediately affecting these organs.

Another cause of difficulty is, that even when the indigestion is the original disease, in proportion as the general affection of the system increases, and becomes independent of the cause which produced it, the stomach, as we have seen, to

a certain degree recovers its tone. But in these cases it will be found, that affections of the digestive organs have, in some part of the disease, formed the prominent feature, and that the nervous symptoms were then chiefly influenced by causes directly affecting these organs; while, in the other case, the patient can recollect no period in which this was very remarkably the case, although, of course, disorder of the digestive organs has always, more or less, increased his sufferings.

The nature of the remote cause also assists the diagnosis, whether it has been a cause acting immediately on the nerves, or on the digestive organs: but we are less assisted in this way than would at first appear; for sometimes, causes acting on the nervous system alone, affections of the mind for example, debilitate the digestive organs, without otherwise materially injuring the functions of that system. Here we still judge how far this is the case, by observing whether the nervous symptoms are as much under the influence of the state of the digestive organs as they are found to be in original indigestion.

In some instances of obstinate indigestion, we can detect, from local symptoms in other parts of the system, original nervous weaknesses, which at once explain the nature of the case, and account for its obstinacy. There can be no doubt, for example, respecting the nature of the indigestion which attends diseases of the spinal marrow, or of any other disease which we know particularly debilitates the nervous system. In other instances, there is a combination of the two sets of causes, particularly in men who have led in all respects dissipated lives; and those whose nervous system is, by its original conformation, feeble; and both the digestive organs and nervous system are doubly weakened, first, by the original causes of the disease, and then by their diseased states influencing each other.

But, independently of the remote causes, the physician will seldom be deceived if he trust to the state of the symptoms which has been pointed out, or if he is at a loss, the effects of the means of cure will generally soon determine the point. He will generally soon be able to judge whether the means which relieve the digestive organs influence the nervous symptoms as much as they are found to do when the disease origi-

nates in those organs. In this case, he may confidently trust to the means of strengthening them, which are seldom employed in vain, if the patient has resolution to second for a sufficient length of time the efforts of the physician. If it appear that the disease has originated in the nervous system, we must be cautious, even in cases apparently most favourable, how we promise a cure.

Here we have evidently two objects in view; to correct the nervous affection which is the cause of the disease; and, while this is being attempted, as far as possible, to obviate its effects on the digestive organs, which, in addition to the more direct suffering they occasion, tend to aggravate the cause which has produced them.

Our chance of success in the first of these objects will depend on the nature of the nervous affection, which is always more or less obstinate. If it consists in a general debility of the nervous system, which is the most favourable case, general tonics, particularly iron, and the different forms of the cold bath, and above all, frequent change of place, are, of all the usual means, according to my experience, the most successful.

In the use of the first, we are generally much restricted by the inflammatory tendency which prevails in all long-continued irritation of the nervous system; and it is not uncommon in such cases to be obliged not only to lay aside iron, but all other tonics, unless we can in a great measure counteract this tendency, which can never be perfectly done, and sometimes hardly at all for any length of time. With respect to the cold bath, it must always at first be employed with caution, else it may rather overpower than invigorate. Change of place is the most powerful means of correcting general nervous debility; and some mineral waters appear to have a certain power over it, although it is often difficult to say what is to be ascribed to them, and what to the change of place and habits that generally attend their use.

I shall have occasion, in treating of the third stage of indigestion, to speak at length of a remedy from which, in the case before us, I have seen decided advantage. I mean voltaic electricity, which, more than any other means we possess, influences the state of the nervous system. Like that of other tonics, we shall find its employment limited by the prevalence

of the inflammatory disposition; but I shall defer any more particular observations on its use till the reader is made acquainted with the principles on which it is founded.

It is almost unnecessary to observe, that while we are thus attempting to remove the original cause of the disease, nothing which tends to prevent the derangement and promote the due functions of the digestive organs should be neglected; whatever disorders them will essentially tend to counteract the means of cure.

The most obstinate case is that in which the debility of the nervous system is supported by a local cause. The means of cure must then depend on the nature of that cause, and their consideration would here lead into too extensive a field. In general, they are far from effectual, except when that cause admits of surgical aid. On the influence on the digestive organs of affections of the spinal marrow, which strongly illustrates the subject of this chapter, I shall have occasion to speak at some length in treating of the third stage of indigestion; and shall defer till then the observations I have to make on it, as connected with the present subject. In my treatise on the preservation of health, and particularly the prevention of organic disease, I have entered much more fully into the nature of that species of indigestion which arises from a debilitated state of the nervous system than would be proper in such a treatise as the present. We find it, as it proceeds, both in its nature and symptoms, more and more deviating from the disease which forms the proper subject of this Treatise, namely, that form of indigestion which originates in the digestive organs themselves.

## CHAPTER VI.

### *Of the Influence of Indigestion on other Diseases.*

It appears, from what has been said, that indigestion, in its first stage, consists in a debilitated state of the stomach, and the other organs immediately connected with it in the function of digestion, in consequence of which, the food being improperly changed, these organs are exposed to causes of irritation; which, if long continued, occasions some inflammatory disposition in them, in consequence of which the parts most exposed

to the causes of irritation become tender on pressure; and as every affection of these organs is felt throughout the system, as soon as this happens more or less tightness of pulse is perceived, and consequently more or less general inflammatory disposition prevails; this state of the disease constituting what I have termed its second stage.

From this view of the subject it would have been easy to foretel, that indigestion, in its first stage, being a state of mere nervous irritation of the digestive organs, producing by sympathy only a similar state of other organs, would not be found essentially to influence the progress of other diseases, with which it might happen to be complicated; but that, as soon as the continuance of this state had excited an inflammatory disposition in the digestive organs, and consequently throughout the system, its influence on other diseases would be both more considerable, and of a more important tendency; and such, on inquiry, we shall find to be the case.

The intelligent reader will perceive, that it could only be in an extensive work devoted to the subject, that the influence of the second stage of indigestion on other diseases could be discussed in the way, which the prevalence of this disease and its influence on others call for. Who cannot see that an irritated and weakened state of the nervous system, a tightened circulation, and the general prevalence of an inflammatory tendency, must necessarily more or less influence all diseases? The object of the present chapter is to lay before the reader the manner in which they are found to influence a few of the most important; and from what I shall have occasion to say of them, the application of the same principles to other cases will not be difficult. I shall begin with fever.

THE concurrence of the second stage of indigestion and fever is one of the most common combinations. It arises either from fever attacking those labouring under this stage of indigestion, or from the latter supervening in the course of the fever.

I shall here beg leave to quote some part of what is said of the nature of fever in the Preface to the fourth edition of my *Treatise on Simple and Eruptive Fevers*. The more I have considered the subject, and observed the course of febrile diseases, the more it appears to me, that the view there taken of

it is consistent with the phenomena of those diseases ; and leads to the proper treatment under their various forms. But my reason for troubling the reader with it here is, that it seems to explain the relation which subsists between them and the disease which forms the subject of this Treatise, and I shall enter no farther into the nature of fever than is necessary for this purpose.

“ It is impossible to subject the whole system to sufficiently minute observation, to make the immediate cause of fever the subject of experiment ; but we know that there are local diseases capable of exciting fever, and it may be possible to ascertain by experiment the state of the part on which these local diseases depend ; and thus to arrive at a knowledge of one or more changes in the vital organs capable of producing fever : and by comparing the phenomena of these diseases with those of simple fever, to ascertain how far the same changes, which we observe in the part, obtain throughout the system, as soon as the irritation occasioned by the state of that part, or any other cause, produces fever.

“ It appears, from experiments made with the assistance of the microscope, related in the Introduction to my Treatise on Symptomatic Fevers, to which I have already had occasion to allude, that inflammation arises from debility of the capillary vessels, and their consequent distention by the force of the circulation ; and that we can at will produce inflammation by debilitating the capillaries, and relieve it by increasing their action. Wherever, therefore, the symptoms of inflammation, increased temperature, redness and swelling appear, the capillary vessels are debilitated, and preternaturally distended.

“ Now, in the hot stage of fever, all the surfaces are, to a greater or less degree, affected with increased temperature, redness, and swelling ; and as the debility and consequent distention of the capillary vessels of a part, however small and unimportant, as appears from direct observation, produce increased action of the larger arteries of the part ; this general debility and distention of the capillaries produce increased action of the whole arterial system. In local inflammation, the debilitated vessels being comparatively few, the force of the circulation quickly, and to a great degree, distends them. In fever, the debilitated vessels being very numerous, it produces this effect more slowly, and to a less degree, in proportion as the resistance is greater.

“ If in any part the vessels are weaker than in others, they suffer a greater degree of morbid distention ; particularly after the increased action of the heart and large vessels has been excited. Hence arise the inflammations which so frequently supervene in fevers. These act, as we find inflammation of any importance does in other cases, in supporting the morbid excitement of the heart and arteries. Thus it is, that the treatment of such affections is of the first importance in determining the course of the fever.”

Thus far I think experiment and direct observation enable us to go towards ascertaining the nature of fever. It is not my object in the present work to inquire how far this view of it enables us to proceed in explaining the course it takes, and the effects of the means of cure ; we are to confine our attention to the concurrence of fever, and the second stage of indigestion.

Now, in those who labour under indigestion, we have seen that some of those parts which greatly sympathize with the stomach, generally suffer most. These therefore are the weak parts which most feel the effect of the morbidly increased force of circulation in fever. Their vessels are most apt to suffer distention, producing congestion or inflammation, according as the distention is in the larger or smaller vessels.

The liver, it appears from what has been said, is the part which most frequently suffers by sympathy in indigestion. It therefore often happens that, when those labouring under this disease are attacked with fever, a train of symptoms, similar to that detailed in speaking of the symptoms, whose treatment does not fall under the general plan of cure, supervenes ; the proper treatment of which is essential to that of the fever. And this is the more apt to happen in those who labour under the second stage of indigestion, because here the previous affection of the part has already assumed the inflammatory disposition.

The principle of the treatment of these symptoms, when they supervene in fever, is precisely the same as when they occur without it, but the actual practice is not altogether so. The fever, in its early stages, by adding to the severity of the inflammatory symptoms, renders more active means necessary. Hence, if the general symptoms do not indicate general loss of blood, a greater local abstraction of it is usually proper, than when no fever but that occasioned by the local affection attends.

The same observation applies to the use of purgatives. In such a state of the liver, the action of the bowels is particularly beneficial, and by the presence of fever it is rendered doubly so. It is thus that brisk doses of calomel at this period are more beneficial than other mercurials, and the necessity for them, and the extent to which it is necessary to carry them, is in proportion to the degree in which the langour of the circulation in the liver prevails.

In the latter stages of fever, on the contrary, if this affection of the liver still continue, which is not uncommon, either from its having been neglected in the early stage, or from its proving more obstinate than usual, I have always found the minute doses of blue pill, above specified, given every six or eight hours, most beneficial. Combined, indeed, with moderate evacuations of blood from the part, or (when the tenderness is inconsiderable, and the affection of the liver rather betrays itself by a vitiated secretion of bile, than by inflammatory symptoms) blisters applied to the region of this organ, they rarely fail to restore due action to it; unless the nature of the fever, or constitution of the patient be very unfavourable; and thus the fever is often removed, which, when its symptoms have become mild, is frequently at this period prolonged by the local affection alone.

When the sympathetic disease, previous to the attack of fever, has chiefly affected other parts, the bowels, the lungs, the brain, &c., we still find the part most affected by that disease suffering most in the fever; and the same plan of treatment is applicable, except that the same benefit is not to be expected from the specific operation of mercury.

When indigestion has not arrived at its second stage at the time the fever makes its attack, the accession of this disease, by increasing the inflammatory tendency, sometimes induces that stage. The vessels, although they had not been sufficiently weakened to yield to the usual force of the circulation, yield to its increased force; and it particularly deserves attention, that an attack of fever, as I have repeatedly witnessed, is often the means of permanently converting the first into the second stage of indigestion; so that the fever leaves behind it tenderness of the stomach, and more or less hardness of the pulse, where they had not previously existed.

When this is the case to any considerable degree, the pa-

tient is generally for a certain time liable to a renewal of fever from slight causes; and if the morbid state of the digestive organs be not removed, he is often exhausted by repeated attacks of fever, which, as the debility increases, assume a more chronic form, and sometimes at length terminate in the more severe species of what has been called nervous fever.

The treatment of fever, in those who have long laboured under the second stage of indigestion, in its severer forms, requires great circumspection. It is surprising after how moderate a degree of fever symptoms of danger often arise in them. Both the vascular and nervous systems of some organ necessary to life have been previously enfeebled, and it sometimes wholly loses its power before the fever produces any very great general effect. The patient dies as much of the disease under which he has so long laboured, as of the fever which has supervened on it; and that at a time, perhaps, when his physician's mind is abstracted from the former. It should constantly be kept in view that patients of this description bear evacuations ill, and that both from this cause, and from the general symptoms being so much influenced by the local affection, local blood-letting and blisters are, for the most part, better suited to them than general blood-letting. These observations have been so often impressed on me in the course of practice, that I cannot help, in a particular manner, calling the attention of others to them. The more we see of disease, we shall, I think, be the more ready to admit that the digestive organs form so important a part of the animal system, and are so intimately connected with every other part of it, that there is no serious disease in which their state can with safety be disregarded.

THE remaining part of this chapter I shall devote to the concurrence of the second stage of indigestion and two other diseases, which are essentially influenced by it, and with which it has very often happened to me to see it combined.

Of local diseases, we should expect to find those most influenced by indigestion, which have their seat in the parts that most sympathize with the digestive organs. Thus it is, that in all diseases of the brain and lungs, the effects of its influence are very striking; and it will appear, from what will

be said of the third stage of indigestion, that we have reason to believe that some of the most severe affections of both these organs are often caused by it.

It is remarkable, that although those who have long laboured under indigestion are more subject to inflammatory affections than those in health, they are much less subject to their more acute forms, all the diseases of habitual dyspeptics partaking more or less of the chronic nature of the habitual affection. They are rarely attacked, for example, with the acute inflammation of the brain and lungs to which the more robust are subject; but in them, with milder symptoms, these diseases are often equally, or more dangerous, which arises from several causes: the previous debility; the means of relief being more circumscribed, for habitual dyspeptics, even where they do not appear much debilitated, generally bear loss of blood ill; the continued irritation of the habitual disease, and the digestive organs generally partaking of that which has supervened. Besides, in proportion as the system is debilitated, its healing powers, on which the success of all our means depends, are impaired.

The obscurity of the symptoms, by which alone in many instances, the state of the digestive organs can be ascertained in complicated cases, may also be ranked among the sources of danger; for in consequence of it, the attention of the practitioner is often confined to the symptoms indicating the inflammation of the brain, or lungs, not without surprise that affections apparently much less severe than those he has been accustomed to see yield to his measures, should here resist them. This naturally induces him to increase their power, which, unfortunately, generally makes a greater impression on the strength than on the disease.

It is essential under such circumstances, to correct, as quickly, and with as little loss of strength, as we can, the derangement of the digestive organs, which is supporting the new disease. The debility previously induced on the nervous system in such cases, is always a principal source of the danger; and it is impossible to restore its vigour while the causes which have impaired it continue to act. Thus it is, that inflammation of the brain, in those who have suffered from long-protracted disorder of the digestive organs, so generally proves

fatal; and that the patient sometimes sinks without the usual forerunners of such a termination.

Both diseases prey on the source of nervous power, essential to life in every part of our frame; and death often suddenly closes the scene, when a common observer can see no cause for the extreme loss of strength which the patient has evidently sustained. There are few cases in this country whose changes are so rapid, and which, after a certain period, become so unmanageable, as the combination we are here considering.

Physicians have, since the experiments of Haller, been too much inclined to regard the nervous system, as far as relates to the functions of life, merely as the organ of sensation; while the truth is, that although the power of the heart and blood-vessels is not immediately dependent on the nervous system, that system is not only capable of directly influencing all their motions, but even of directly destroying the power on which they depend\*: and even this can hardly be regarded as the most essential respect in which the life of the animal body is under the dominion of the nervous system; for it appears from direct experiment, that on the nervous power, not only the function of many, but the structure of all the vital organs immediately depends; and that the ganglionic system of nerves, so far from being merely an organ of sensation, is itself as much a vital organ as the heart or lungs, and equally, though not as immediately, essential to life†.

To this powerful influence of the nervous system we must ascribe many of the phenomena observed in protracted cases of indigestion, by which the functions of that system are impaired, and sometimes at length subdued; and many of the phenomena which arise from a combination of indigestion with other diseases. Can the influence of such a cause be confined to one class of diseases? the attentive practitioner will observe it pervading every complaint of the dyspeptic; and it may often be regarded as the leading principle by which their

\* It is an observation as old as Aretæus, that inflammation of the brain is apt to produce fainting, *φρενιτις γὰρ εὐτρεπτόν ἐς σύγκοπην κακόν*. In the dyspeptic, for the reasons which have been mentioned, this is most apt to happen, and is one of the most fatal combinations.

† *Inquiry into the Laws of the Vital Functions*, chap. ii. and v., third edition.

course is regulated. It is of the first importance, therefore, in all such cases as that we have been considering, to ascertain the state of the digestive organs.

The principal symptoms by which the presence of the affection of these organs is here ascertained, and its degree estimated, are nothing more than tenderness, and more or less fulness in the region of the pylorus and duodenum; symptoms which will never be mentioned to the practitioner, and consequently will pass unnoticed, if he does not inquire for them. I have, in hundreds of instances, where serious disease was kept up by this cause alone, seen immediate and general relief obtained by relieving these symptoms, which may generally be done at little expense of strength; a relief which the most powerful measures had not previously been able to procure.

It may be said, perhaps, that it is difficult to suppose that an irritation capable of so much mischief, should betray itself by so few symptoms, and those of so slight a nature; the reply is, that many of its other symptoms are mingled with, and consequently obscured by those of the additional disease, and that the most severe irritation of the digestive organs often shows itself only by affections of distant parts, the head for example, or the chest \*. The obstinacy of the case before us is the effect, and therefore its symptoms are the symptoms of this irritation. The fulness and tenderness of the epigastric region are only the means by which we ascertain the seat of the irritation; a point which, from the power of the sympathy of parts, it is often difficult otherwise to determine; and I can say, from much experience, they are means that will seldom deceive us, if the examination be made in the way above pointed out.

Luckily, inflammation of the brain, or its membranes, is not a frequent disease, and therefore its concurrence with protracted indigestion, though by no means uncommon, is rare, compared with the combination of the latter with inflammatory affections of the chest, which is among the cases of most frequent occurrence.

It is the duty of every practitioner to inquire into the pre-

\* How common, for example, is a severe fit of indigestion, which betrays itself by no other symptoms but headach. Could headach, so caused, be cured by means directed to the head alone? The same cause, which can produce the less serious affections in distant parts, can aggravate and prolong the most alarming.

vious state and habits of his patient; and if he finds they have been those of the dyspeptic, he may suspect, in inflammatory affections of the head and chest, that the digestive organs partake of them; and be assured that, if such be the case, his means will very probably fail, if directed only to the part more prominently affected. Indeed, such is the sympathy of these organs with every other part, that it is a good, and it is surely a very easy, precaution to inquire into the state of them in all cases. This can never do harm, and much harm I have often witnessed from its having been neglected. It is the more necessary, because, even in cases where there has been no previous affection of them, the disease of other parts often spreads to them, which is particularly apt to happen in the cases at present before us. Even in inflammation of the brain, induced by a blow on the head, it is by no means uncommon for that of the liver to accompany it, on the treatment of which the event of the case, in a great measure, always depends.

There is something peculiar in the sympathy which exists between the brain and liver, as the fact just stated evinces, and which still more strikingly appears from the circumstance, that while, even in the most violent inflammation of the stomach and bowels, the head generally remains clear, (I have seen this disease prove fatal within twenty-four hours from the attack, the head remaining perfectly clear to the last,) delirium is a common symptom of inflamed liver. The same thing is conspicuous in the dejection which usually attends common bilious complaints; and the striking manner in which the secretion of bile is often influenced by affections of the mind. The very name of melancholy is a proof of the sympathy we are considering.

The inflammatory affections of the chest in dyspeptics are still more apt than those of the head to spread to the digestive organs. It is but rarely indeed that they do not. When a dyspeptic is more or less suddenly attacked with difficulty of breathing, cough and fever, the region of the stomach towards the right side almost always becomes more or less full and tender; and the treatment for inflammation of the lungs or their membranes then gives only temporary or imperfect relief, if not combined with means directed to the digestive organs.

It is particularly deserving of notice, that general blood-letting, on which we here chiefly rely for relieving the affection of the lungs, in such cases usually makes little impression on that of these organs; and the continuance of the disease in them both renders the relief of the lungs imperfect, and disposes to a return of their inflammatory state. In these cases, it is essential to combine with the general blood-letting, abstraction of blood from the tender part, and a strict attention to the medicinal part of the treatment of the second stage of indigestion. I can say, from a very great number of such cases, that by these means their treatment, which is usually tedious even where it is ultimately successful, is rendered as uniformly manageable, and nearly as expeditious as that of ordinary cases of pulmonary inflammation; and is often attended with less loss of strength, for the inflammation being of a less active nature, less general blood-letting is required.

Did my limits permit, it would be easy to point out a similar connexion between affections of the digestive organs and a great variety of other diseases.

THE variety of symptoms which present themselves in the various deviations from a state of health, is so great, that were they not divided into classes, and arranged under the heads of diseases, it would be almost impossible either to acquire or retain a knowledge of them; but diseases do not always appear, in actual practice, in the distinct forms in which they are set down in the works of systematic writers: who have not in general been sufficiently careful to point out the manner in which they are combined, and the means of cure influenced by their combinations. More than half the cases we meet with are combinations of diseases rather than simple diseases.

It may be useful here to present to the reader a short recapitulation of the different parts of the subject which have engaged our attention.

### *Recapitulation.*

WE have now traced Indigestion from its commencement to the moment at which it is about to terminate in organic disease; for a repetition of the more severe local affections of the second stage often terminates in change of structure, which,

when thus produced, seems in no degree to differ from organic disease of the same parts, arising from other causes.

In the commencement of Indigestion we have seen that the muscular and nervous powers of the stomach are enfeebled, and that the debility gradually extends to the other parts of the alimentary canal, to the liver, and at length, more or less, to every part of the system.

The irritation caused by the contents of the stomach, which, from the debilitated state of the nervous and muscular powers of this organ, have acquired morbid properties, at length produces a degree of inflammatory action in the part of the stomach most exposed to it, the symptoms of which I have regarded as characterizing the second stage of the disease; and as, in the first stage, the deranged function of the stomach produces a tendency to deranged function in every other part; in the second stage, every other part, in like manner, partakes of this inflammatory tendency. The pulse becomes tight, and inflammation is every where readily excited, particularly in the parts which most sympathize with the stomach, or are from other causes most liable to disease.

In the first stage, the debility of the nervous and muscular powers of the stomach is to be counteracted by attention to diet and exercise, a proper use of aperient, stimulant, and tonic medicines, and such means as tend more directly to correct the vitiated state of the secretions; and, in proportion as it is relieved, the sympathetic affections, which depend on it, disappear.

In the second stage, it is necessary to obviate the inflammatory tendency, and only to employ the means suited to the first stage, as far as they are compatible with this object; while our attention must now at the same time be directed to the parts sympathetically affected, in which, from the longer continuance of deranged function, and the inflammatory tendency prevailing throughout the system, the sympathetic begins to be changed into real disease.

The affection of these parts, we have seen, like that of the stomach, from which it arises, now consists in a debility of the vascular, as well as nervous, power. On these powers depend the secreting and absorbing processes, which are as immediately necessary to the continuance of the healthy structure as

the healthy function of the part ; except that, from the nature of the function, it is quickly affected,—from that of the structure, its changes take place more slowly.

When the function of any part has repeatedly suffered, after the inflammatory tendency is established, it often continues more or less permanently disordered, and its affections become the most prominent part of the disease, and often, particularly in the parts most liable to it, end in change of structure. In certain habits, where no particular organ is much more liable to disease than the rest, the second stage of indigestion, we have seen, sometimes, by impairing the general powers of the system, produces a state of general and obstinate debility.

Whichever of these courses the disease takes, its original seat is generally more or less relieved, in proportion as the sympathetic disease becomes the more prominent affection ; a circumstance which, in both instances, particularly in the latter, increases the difficulty of distinguishing the sympathetic from original disease—a distinction, we have seen, necessary, both in judging of the event, and regulating the treatment. This subject we shall find farther illustrated in considering the third stage of indigestion.

When indigestion has produced change of structure, it constitutes, we have seen, what I have called the third stage of the disease, which we are now more particularly to consider.

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## PART II.

### OF THE THIRD STAGE OF INDIGESTION.

THE stomach is less liable to change of structure than most other organs. This change, therefore, in the disease we are considering, except very rarely where we have reason to believe that other causes conspire, takes place, not in the stomach, but in the parts with which it sympathizes\*.

\* In old dyspeptics we often find in the pylorus, not only indications of languid inflammation, but even abrasion of its surface, without organic disease. The scirrhus pylorus I believe is never a consequence of indigestion alone.

The diseases, which arise from neglected indigestion, are so various, and so different from the disease from which they spring, as well as from each other, that to give anything like a satisfactory account of them would require a treatise of greater extent than the whole of that now presented to the public. I shall therefore consider only those cases, to which, from their great frequency in this country, my attention has been particularly directed, I mean the pulmonary affections produced by a disordered state of the digestive organs; and the principles which I shall have occasion to illustrate in treating of those diseases, will be found applicable to others arising from the same source.

Organic disease, in the common acceptation of the term, is disease attended with such change of structure as is apparent on dissection after death. This involves a change of structure in all the parts of the diseased organ. We cannot doubt, however, that there is a change of structure in the minute mechanism of the nervous system, which leaves no traces to be detected after death. Thus we have seen, that in those who have long been exposed to causes of great nervous irritation, the function of the brain and spinal marrow sometimes fails. The usual stimulants cease to produce their accustomed effects. This at first is only occasional, and the organs soon resume their usual functions; pointing out that, however their action has been oppressed, their mechanism is still entire, and has, if disordered at all, only been temporarily so: but, by degrees, the diseased state becomes more permanent; and, at length, sometimes ends in that species of palsy, or apoplexy, in which, although the permanent inability proves, dissection cannot always detect, change of structure.

I have often had occasion to call the reader's attention to a fact, which is at once evident to all in the least degree acquainted with the structure and functions of the animal body, that it must, except under particular circumstances, be through the nervous system that any organ can be influenced by a distant part. We have also seen an intimate connexion between the function of the nerves and that of the vessels in those processes which effect the constant changes going on in the body. It is on a healthy state of the vessels that that of the nerves, as well as of all other parts, evidently depends; and, on the other hand, the vessels are not only directly influenced through

the nerves, but the nerves of a secreting organ are never disordered without influencing the secreted fluids, and, consequently, without tending in this way also to influence the vessels which supply them. Thus it is, in the common course of things, that, sooner or later, in cases of long-continued nervous irritation, the vessels either of the part to which the irritating cause is applied, or some part which sympathizes with it, deviate from the healthy state. This, we have seen, constitutes the difference between the first and second stages of indigestion. In the former, the nerves and secreted fluids alone are affected; in the latter, the vessels partake of the disease.

The facts just stated, however, prove that, in some cases, where either the nerves are more liable to disease than usual, or the vessels less so, a permanent change in the former takes place before the vessels become affected; this change either occurring in the nerves of particular organs, or in the general source of nervous influence; producing in the one instance permanent loss of power in a part, in the other, in the whole system.

This permanent change, when it is confined to a part, and the animal consequently is capable of surviving it, operates, as all other established disease does, in tending to prevent disease of other parts; and the vascular system of the organs affected, notwithstanding the more or less vitiated state of their secretions, often for a long time retains its functions.

Thus we find, on inquiry, that the permanent diseases of distant parts produced by sympathy with the state of the stomach in indigestion, are of two kinds; one, in which the nerves alone, and another in which both the nerves and vessels are affected. Of these the latter is by far the most frequent.

Of those two kinds, then, are the sympathetic affections of the lungs which we are about to consider. In the one, the disease is confined to the nerves of this organ. In the other, it extends to all its vital parts.

I have already had occasion to observe, that many years ago, I presented to the Medico-Chirurgical Society, an account of the latter, under the name of Dyspeptic Phthisis, which the Society did me the honour to publish in the seventh volume of their *Transactions*. This account I am here about to present to the reader, with the additional observations which I have since made on that disease.

The disease produced by a permanent derangement of the nervous power of the lungs, alone, for want of a more appropriate name, I called Habitual Asthma. My attention was first attracted to it by finding, that the difficulty of breathing occasionally produced by indigestion, when it had lasted for a considerable time, often did not yield with the other symptoms of this disease; and then generally resisted the effects of medicine.

This affection, in many instances, gradually increases, notwithstanding every effort to relieve it, till it unfits the sufferer for all the active duties of life. It was with peculiar satisfaction, therefore, that I found galvanism an almost uniform means of relief in it, and not unfrequently of cure.

This induced me, in 1816, to present some observations on this effect of galvanism, and my reasons for believing that habitual asthma depends only on an affection of the nerves of the lungs, to the Royal Society; which did me the honour to publish them in the *Philosophical Transactions* of the following year. I shall, after considering dyspeptic phthisis, lay before the reader the observations there published, with such additions as have since occurred to me.

## CHAPTER I.

### *Of Dyspeptic Phthisis.*

It is very common for the different species of pulmonary consumption to be regarded as the same disease, and treated in the same way; yet it will be evident, I think, from the following observations, that the nature of that species which I am about to consider is peculiar; and that while, under the common treatment, it is nearly as fatal as the other forms of the disease; under that which is suited to it, its progress may generally in the earlier, and sometimes in the more advanced, stages be arrested.

I shall, in the first place, point out the symptoms by which this species of pulmonary consumption is distinguished; then make some observations on its nature and causes, and the appearances discovered by dissection after death; and, in the last place, detail the plan of treatment which I have found most successful in it.

SECTION I.—*Of the Symptoms of Dyspeptic Phthisis.*

I HAD occasion, nearly thirty years ago, to mention this species of consumption, and the plan of treatment which appeared to me best adapted to it, in a *Treatise on Febrile Diseases* \*. Since that time it has particularly attracted my attention. It cannot, therefore, I think, fail to be of some use to those whose attention has also been directed to it, to see the observations I have been led to make in so many years' experience of it. To those whose attention has not yet been particularly directed to dyspeptic phthisis, any observations on it must be useful.

It is not my intention to give a detailed account of the symptoms of this species of phthisis. I shall only mention the symptoms and modifications of symptoms by which it is distinguished.

It is generally preceded, as appears from what has been said, by symptoms of indigestion, and particularly by those which indicate some disorder in the secretion of bile. Contrary to what is usual in other species of the disease, the spirits from the beginning are generally more or less depressed, and the countenance is often sallow.

The cough at first is usually dry, or the patient brings up a little mucus after a severe, and often long-continued, fit of coughing, which seems to be rather the effect of the irritation of the cough than any thing which had previously existed in the lungs; for the cough, particularly in its early stages, frequently comes in violent fits, in the intervals of which the patient is often but little troubled with it. These fits are particularly apt to occur after he has eaten, especially if he has eaten a great deal, or any thing by which the digestion is disturbed; and on lying down.

In many instances they are most apt to come on when he lies on the left side, sometimes when he lies on the right. I think, in almost all cases, they are least apt to occur in the recumbent position, when the patient lies on the back rather inclining to the right side, with the shoulders a little raised; and it often

\* In the fourth edition of this *Treatise*, from the great extent of the work, it was judged proper to divide it into two *Treatises*; to which, in the present *Treatise*, I have occasionally referred; the one entitled, *On Simple*, the other *On Symptomatic*, Fevers.

happens, in the more advanced stages, and often before the strength is much exhausted, that this is the only position in which he can lie without inconvenience. It is common in this form of phthisis, as indeed in all others, for the cough to be troublesome for some time after awaking in the morning. As the disease proceeds it becomes more frequent, returns less decidedly by fits, and is attended with a more copious expectoration. In the foregoing respects there is, of course, considerable variety in different cases, but, in almost all, the general character here pointed out may be observed.

The matter expectorated is at first limpid and glairy ; by degrees we see intermixed with it small portions of an opaque pus-like substance, the proportion of which in the progress of the disease increases ; and in some cases the quantity expectorated is surprising, often much greater in proportion to the severity of the other symptoms, than in other species of phthisis. I have seen half a pint or more of pus-like matter mixed with tough phlegm, and sometimes tough phlegm only, expectorated daily, when the other symptoms were comparatively mild.

In other species of phthisis, very copious and long-continued expectoration of pus-like matter is less common. In them such copious expectoration generally arises from the bursting of an abscess ; and the matter it contained, if not sufficient to occasion suffocation, being brought up, the quantity expectorated is again reduced till another abscess gives way.

Bloody expectoration is by no means uncommon in this species of phthisis. Blood often appears early in the disease, mixed with the colourless phlegm. After the pus-like expectoration commences, if blood has not previously appeared, it is much less apt to appear than in other forms of the disease. If it appear even in small quantity after this stage commences, the case often proves fatal.

While the blood is mixed only with a transparent fluid, there may be good hopes of recovery, certainly better than under the same circumstances in any other species of phthisis. A similar observation applies to the pus-like matter, if there be no admixture of blood.

The expectorated matter is less apt than in other forms of the disease to assume a sanious appearance ; but when this

occurs, it seems to indicate nearly as much danger as in them. If it happen under the proper treatment, there is no hope.

I here wave all discussion respecting the means of distinguishing pus and mucus. In my treatise on *Symptomatic Fevers*\*, I have considered the question at length. It is necessary, in practice, to have means of judging independently of nice experiments. Whether the matter I call pus-like be pus or not, is not here the question; it is that to which the observations, which I am about to lay before the reader, apply. The only criteria, which I have found necessary in practice, are its pus-like appearance, and its sinking when so agitated in water as to separate it from the tough mucus with which it is mixed. I am inclined to think that this substance is almost always real pus. But, if we know what states of disease are connected with the different appearances of the expectorated matter, it is of comparatively little consequence whether what we see be pus or not.

The breathing, in the earlier stages of this species of phthisis, is sometimes more oppressed by the recumbent posture, than in other forms of the disease; and is more frequently attended with a sense of tightness across the pit of the stomach, and the difficulty of breathing, like the cough, is more apt to recur in fits. The same observations which apply to the cough in the recumbent position, and after eating, apply to the difficulty of breathing; but it often happens, in the early stages, that there is little or none of this symptom; and there is very rarely, except in the advanced stages, that marked difficulty of breathing on exercise, which so frequently attends even the commencement of other species of phthisis.

There is often little or no pain. In many cases the patient is subject to a dull pain in the pit of the stomach, or pretty low down in the left side of the chest; more rarely the pain is in the same part in the right side. There is hardly ever a fixed pain high in the chest, except about the shoulders. There it is not uncommon, and the patient frequently complains of an uneasy sensation and a sense of oppression under the breast-bone. Sometimes he complains of darting pains in various

\* Page 30, *et seq.*, fourth edition. The criterion of pus, proposed by Dr. Young, in his work on *Consumptive Diseases*, p. 27, if its certainty be admitted, appears to me the best, as it is the most easy of application.

parts of the chest, and frequently in more distant parts, particularly in the back and shoulders, and in the legs; and is often subject to head-ach.

The hectic fever is hardly ever completely formed at so early a period as in other species of phthisis, and sometimes there is copious purulent expectoration, with but slight fever, and that not at all assuming the form of hectic, the skin remaining dry in the morning, and there being little or no evening exacerbation; a state of the symptoms hardly ever observed in other forms of the disease. In many cases the fever never exactly assumes the form of hectic.

The emaciation is seldom so rapid as in other species of phthisis, but seems to keep pace with the state of the fever.

Such is the manner in which the symptoms common to all forms of phthisis are modified in this species of it; but a diagnosis resting merely on the modification of symptoms must always be more or less fallacious; it is therefore fortunate, that in the present instance there are superadded to the usual symptoms of phthisis, others peculiar to this species, by which, with very little attention, it may always be distinguished; those indicating a deranged state of the digestive organs.

The patient is often distressed with flatulence, acidity, and irregular bowels; the tongue is furred, the appetite, for the most part, contrary to what is usual in other forms of the disease, much impaired. The variety in this respect, however, is considerable. Sometimes there is a false appetite which fails after a few mouthfuls, and a sense of oppression after eating, as if there were not room for what had been taken.

The alvine discharge is seldom well-coloured, and the region of the stomach, at the place pointed out in a former part of this treatise, is more or less full and tender on pressure. In many cases, particularly in those of some continuance, there is also a greater degree of fulness and firmness lower down in the right side than in the corresponding part of the left side, in like manner often attended with tenderness on pressure. Much less frequently there is some preternatural fulness, and a degree of tenderness in the left side also. In short, the digestive organs are in the state in which they are usually found in the second stage of indigestion.

All these symptoms vary much at different times, but the

patient is hardly ever free from them. The connexion between them and the pulmonary symptoms is rendered evident by the latter increasing with the former, so that when the region of the stomach is very full and tender, and the flatulence and acidity more troublesome than usual, the cough and dyspnœa are so also; and on the former symptoms subsiding, the latter likewise abate. Even the rising of wind from the stomach, often, for the time, removes the tendency to cough.

The foregoing are the symptoms of the more early stages of this species of phthisis. In its advanced stages, it approaches more and more to other forms of the disease. All the symptoms, which more particularly indicate a tubercular state of the lungs, often show themselves; the cough is more constant, and partakes more of the hacking kind, the breathing is more affected by exercise, and the hectic is more completely formed.

According to a law of sympathy, to which I have had frequent occasion to refer, the fulness and tenderness in the abdomen, with the various other symptoms indicating derangement of the alimentary canal, now that the disease is fixed in the lungs, are often lessened, and sometimes wholly disappear; which, if the pulmonary symptoms continue unabated, always, I believe, affords a fatal prognosis.

The patient at length often sinks with the same symptoms as in other species of phthisis. In other cases many of the peculiarities of dyspeptic phthisis may be observed to the last. I have just remarked that sometimes the hectic is never completely formed. In some, bilious pains, inability to lie on the left side, and sudden fits of difficulty of breathing continue to recur, and in some the expectorated matter never completely assumes the purulent appearance.

Some other of the most prominent consequences of severe affections of the digestive organs now and then show themselves, particularly dropsy of the belly, which I never knew to supervene in other species of pulmonary consumption. A degree of general dropsical swelling, the effect of debility, is frequent in the latter stages of all its species.

#### SECTION II.—*Of the Causes of Dyspeptic Phthisis.*

THE species of phthisis which I am considering arises from all the causes of the other forms of this disease, with the

exception of those whose operation is confined to the lungs themselves; the inhaling of dust, other diseases of the lungs, the bones pressing unequally on them, &c. To compensate for the want of these causes, we have a numerous set of causes affecting the digestive organs. Drunkards, in particular, at that time of life which disposes to phthisis, frequently fall a sacrifice to this form of it. In short, we perceive equally in its causes, as in its symptoms, its connexion with the state of the digestive organs; from which it may be justly termed dyspeptic phthisis.

It particularly deserves attention, that in many families, this form of the disease alone appears. Its fatal effects may almost always, I believe, be prevented by carefully avoiding the causes which tend to debilitate the digestive organs, watching the approach of the symptoms enumerated in the first chapter of this Treatise, and immediately correcting any tendency to cough. I have repeatedly had the satisfaction to see the progress of the disease, in families where many had fallen a sacrifice to it, finally arrested by these means.

### SECTION III.—*Of the Appearances on Dissection.*

THE appearances of the lungs are frequently much the same as in other cases of phthisis; but we almost always find at the same time, either some deviation from a healthy state of the liver, or traces of such a deviation having existed in it, for we have seen that it not unfrequently happens that the affection of the liver disappears while the disease is destroying the texture of the lungs. The liver, as in other cases of indigestion, is found most diseased in the lobe which lies nearest the stomach. When the disease of the liver had been severe, and the patient had died as much of this disease as that of the lungs, I have seen those parts of the lungs in the neighbourhood of the liver alone affected, the left side appearing sound, or nearly so.

I shall give the account of the appearances after death in one case of this kind, because it is short and particularly illustrative of the course of the disease. The account is drawn up by Mr. Parnel, of Bennet-street, St. James's, who made the examination. Many of the symptoms characteristic of dyspeptic phthisis in this case continued to the last. The alvine discharge

was generally unhealthy. There were no night sweats, the fulness and tenderness of the abdomen continued, with the inability of lying on the left side, occasional bilious pains, and fits of great difficulty of breathing; and the expectorated matter never completely assumed the purulent appearance.

“ The right lung wholly disorganized, tubercular, and particularly on the upper part cartilaginous. The left lung nearly healthy except at the upper part, and there much less affected than the right. Neither lung contained any abscess. The adhesions were very general and particularly firm in the most diseased parts. The heart was healthy.

“ The liver greatly enlarged and pressing the lungs upwards, throughout its whole substance firmer than natural, and in some places cartilaginous. The left lobe was most affected. The spleen and pancreas were healthy. The internal surface of the pylorus was inflamed and corroded, in other respects the stomach was healthy.”

In the foregoing case we find the pylorus and liver greatly diseased, and that part of the liver most so which lies in the neighbourhood of the pylorus, and in like manner that part of the lungs most diseased which lies in the neighbourhood of the liver. When these appearances are compared with other facts which have been detailed, can we doubt that the affection of the pylorus was the original disease, and that it thence spread to the liver, and thence to the lungs, and that, had the disease of the pylorus or the liver been arrested in the early stages, the lungs would have been saved; but, as usual in such cases, little alarm was excited till the lungs were seriously affected.

In many cases the affection of the liver seems to have little immediate share in the cause of death; and the patient lives, as in other cases of phthisis, till almost the whole lungs are rendered incapable of their function. Here, as in other diseases, we often have occasion to remark to what extent change of structure, even in vital organs, may go without destroying life, when the change is very gradual; a circumstance which, perhaps, more than any other, shows the extent of the resources, by which nature enables us to resist disease.

It is not at all uncommon in dyspeptic phthisis to find the spleen as well as the liver diseased.

SECTION IV.—*On the Nature of Dyspeptic Phthisis.*

It is impossible to observe even in a cursory manner the symptoms of this disease, without remarking that the state of the lungs is connected with that of the digestive organs. Its causes, it appears from what has been said, afford the same inference; and in those who die of it, we have just seen, we very frequently find a diseased state, or proofs of a diseased state having existed, in one or more of these organs.

A question of the first importance in the treatment here arises. What is the nature of the relation observed between the affection of the digestive organs and that of the lungs in this species of phthisis? Is the one a consequence of the other, or are they simultaneous affections arising from a common cause? They are not simultaneous affections, for the one almost always evidently precedes the other.

In by far the majority of cases in which both the lungs and digestive organs are affected, the affection of the digestive organs precedes that of the lungs. In some instances we find the affection of the lungs the primary disease. But in these, the case does not assume the form above described, but that of simple phthisis; and the hepatic affection, which is always the most prominent feature of the derangement in the digestive organs when it is complicated with phthisis, does not show itself till a late period of the disease; and then seems only to influence the symptoms by increasing the oppression and irritation, and hastening the fatal termination.

We often observe the first of these forms of the disease arise from causes evidently acting on the digestive organs, and as far as we can perceive, in no degree on the lungs; and the last, from causes evidently acting on the lungs, and in no degree on the digestive organs.

It seems to be a necessary inference from these facts, that a diseased state of either set of organs may produce that of the other. But the tendency of the disease to spread from the digestive organs to the lungs is much greater, than that to spread from the latter to the former. We often see a slight degree of derangement in the digestive organs produce cough and other pulmonary symptoms, and derangement seldom exists in all the

digestive organs without producing more or less of these symptoms ; whereas, as appears from what has just been said, it is only after disease has advanced very far in the lungs, that it is apt to spread to the digestive organs ; and in the greater number of instances it proves fatal without spreading to them.

When to these circumstances we add, that all the peculiarities of those cases of phthisis, which are from the commencement accompanied with the disease of the digestive organs, may be easily explained by the existence of this disease ; and that, as I shall presently have occasion to point out more at length, every thing which relieves the digestive organs at the same time relieves the pulmonary symptoms, the inference appears to be unavoidable ; that, in the species of phthisis which we are considering, the pulmonary disease arises from the state of those organs.

It is not to be overlooked, however, that it is in those most disposed to pulmonary disease that affections of the digestive organs most frequently produce it. We consequently see this species of phthisis most apt to occur in the same habit which disposes to other forms of that disease. This would be more frequently the case, were it not that those who have weak lungs often have strong digestive organs ; an observation as old as Hippocrates. On the other hand, when the digestive organs are naturally weak, or powerful causes of disease in them have existed, particularly the free use of spirituous liquors, we frequently see it occurring in habits apparently least disposed to pulmonary disease.

It will place in a clearer light what has been said of the nature of the form of the disease we are considering, and tend farther to illustrate the observations which have been made on the first and second stages of indigestion, to take a cursory view of the sympathy which exists between the state of the digestive organs, and the principal seat of derangement in some other diseases. I have already had occasion to refer to a work, which no physician, whatever may be the extent of his experience and the accuracy of his observation, can peruse without advantage, although the modesty of its author has induced him to address it only to those belonging to his own branch of the profession ; I mean the work of the late Mr. Abernethy,

entitled, “*Surgical Observations on the Constitutional Origin and Treatment of Local Diseases.*”

I believe that experience has led many others to similar views, but no other person has laid them before the public in the same way in which Mr. Abernethy has done, and those physicians whose attention has been directed to the same object, must be happy to see in Mr. Abernethy's work, a confirmation of their own observations; and such a confirmation as they were not likely to receive from the work of a physician. The physician's attention is directed to internal disease; there his inquiries naturally begin. Mr. Abernethy's, for a similar reason, began with external disease; and I believe every physician, circumstanced as I was, will feel as I felt on reading his work. I unexpectedly met him on a road where I did not expect to meet a surgeon, but where the assistance of a surgeon was more important than that of any physician could have been. From local, he was unavoidably carrying on his observations to general, diseases. The sympathies in question so connect them that, with his powers of observation, it was impossible for him to do otherwise. From general, I was carrying mine on to local, diseases. In the case of dyspeptic phthisis which Mr. Abernethy relates, the reader will find the principle of the treatment which I have employed in that disease for thirty years, as appears from what is said in the last volume of the edition of my *Treatise on Febrile Diseases*, published in 1804; and the following cases, which occurred to me before I read his work, or was acquainted with his opinions, and which I shall relate as concisely as I can, will afford a confirmation of these opinions and of the practice founded on them in local diseases.

I mention these cases, because, like Mr. Abernethy's case of phthisis, they tend to confirm both his observations and mine; and surely no stronger confirmation can be required of any opinion, than that two observers wholly unconnected, setting out from the most opposite quarters, should meet in the same point. My plans of practice are not precisely the same as Mr. Abernethy's, and in particular the mode of giving mercury in internal disease, which I found most successful, is different from his, but the general principle is the same.

In the most essential respect indeed, our modes of employing this medicine agree. It is from small and undebilitating quantities that good effects are to be expected; given incautiously, it often weakens the digestive organs, and confirms their derangement.

A gentleman who laboured under severe pains of the legs, had been treated unsuccessfully for two years. The digestive organs were deranged, and the region of the stomach tender on pressure. A grain of blue pill combined with stomachic and opening medicines was given three or four times a day; and the pains disappeared in a few weeks. A gentleman had sores continually breaking out in various parts of the body, which had proved obstinate, and for which he had been advised to go through a regular course of mercury. The digestion was deranged, and the region of the stomach tender on pressure. He took stomachic and opening medicines, with a grain of calomel every second or third night, and his symptoms disappeared in about a fortnight. A lady, after repeated attacks of illness, remained in a state of great debility; glandular swellings appeared in different parts of the body, and it was feared that what is called a general breaking up of the constitution was about to take place. The appetite failed, the alimentary canal was disordered, and the stomach tender on pressure. She took sometimes a grain of blue pill two or three times a day, with stomachic and opening medicines, and at other times either a few grains of blue pill, or one grain of calomel, according to the state of the bowels, every second or third night; no application being made to the glandular swellings, but occasionally two or three leeches when they were tender on pressure. In about three months her complaints disappeared, nothing but a depression of spirits remaining, which was removed by change of place.

Mr. Abernethy mentions various internal diseases, particularly those of the head and heart, occasionally caused by the deranged state of the digestive organs. I have repeatedly seen his observations on those diseases confirmed; and could relate cases, in which the patient had for years laboured under symptoms of *angina pectoris*, which yielded in a few weeks to minute doses of blue pill combined with

stomachic and opening medicines. In such instances we must, of course, suppose, that no organic disease of the heart had yet supervened.

His observations on the brain are well illustrated by two excellent treatises, by Dr. Cheyne \*, and Dr. Yeates †, on *Hydrocephalus internus*. It seems surprising, that the immediate connexion of this disease with the state of the digestive organs should so long have escaped physicians.

It is not meant that it, or any of the other diseases I have mentioned, always arises from affections of these organs. In many instances they evidently arise from causes acting on the parts in which they have their seat; but were I to speak from my own experience, I should say, that in at least nineteen cases of twenty this affection of the brain arises from the former cause; and that, in all cases, preserving a healthy state of the digestive organs is the best means of prevention; for even where it arises from other causes, their tendency to produce it will be greater or less according to the state of these organs.

It is well known that nervous affections will, if I may use the expression, mimic the symptoms of almost every disease; but it does not seem to be generally admitted, although I think we have sufficient proof of the fact, that if this mimic disease be kept up for a certain length of time, it will be converted into the real disease, let the cause which produced it be what it may; a position sufficiently illustrated by the observations made in the second and third chapters of the first part of this Treatise.

#### SECTION V.—Of the Treatment of Dyspeptic Phthisis.

IN speaking of the treatment of this form of phthisis, I shall follow the same plan which has been adopted in speaking of its symptoms, confining myself to those circumstances in which it differs from the other species of the disease.

As it appears, both from the symptoms and causes of dyspeptic phthisis, that the affection of the lungs is influenced by

\* *A Second Essay on Hydrocephalus Acutus, or, Dropsy in the Brain*, by J. Cheyne, M.D., Dublin, 1815.

† *A Statement of the Early Symptoms which lead to the Disease termed Water in the Brain, &c.*, in a Letter to Martin Wall, Esq., M.D., &c., by G. D. Yeates, M.D. &c., London, 1815.

the state of the digestive organs, it is reasonable to suppose that the means which tend to improve their functions, will here be a useful auxiliary to those usually employed in phthisis. In indigestion we have seen that the function of the liver becomes disordered, and at length, some degree of fulness, and sometimes tenderness on pressure, in the seat of this organ supervene. It appears from what has been said, that it is after these symptoms have supervened, that disorder of the digestive organs is apt to affect the lungs; and in proportion as we relieve them, we find the affection of the lungs relieved.

This species of phthisis may be divided into three stages, in which the prognosis and mode of treatment are different.

In the first, the affection of the lungs is merely sympathetic, so that when the cause which produces it is removed, it ceases of course. This stage is distinguished by the short time which the disease has lasted, by the general mildness of the symptoms, the fever in particular being very slight, and by there often being no expectoration but what the cough itself seems to occasion, consisting for the most part of a colourless phlegm, and generally in small quantity.

Sometimes what is expectorated is in masses of a tough glairy appearance, and of a blackish hue, as if mixed with a small portion of carbon, which seem to have lain some time in the lungs; the expectoration of which relieves the cough, which, in this case, is seldom very troublesome. This last appearance of the expectorated matter indicates the mildest form of the disease. It is the first symptom of a deviation from a state of health in the function peculiar to the lungs.

The blackish appearance may be at first view ascribed to particles of dust drawn in with the breath. It is too uniform, however, to arise from this cause. Besides it is precisely the same in the smoky air of London and the clearest air of the country, and always disappears as the disease advances. I have now no doubt that it is produced by the first slight deviation from the peculiar function of the lungs, in consequence of which the process by which this organ relieves the venous blood from its superfluous carbon is deranged, and that thus a little of the carbon not being properly combined with the oxygen of the atmosphere is deposited in the lungs and mixed with the mucus expectorated; and this opinion is

confirmed by my having observed that where this appearance occurs the disease is more apt, if neglected, to degenerate into its more advanced stages than where the expectorated mucus is colourless.

In the second stage of dyspeptic phthisis, the continuance of the sympathetic affection has produced more decided disease in the lungs.

There are two ways in which its progress indicates itself. The most frequent is by some degree of inflammation supervening on the surface of some part of the bronchia, or air-cells, in consequence of which the expectorated matter begins to be mixed with small portions of a pus-like substance, which gradually increases as the inflammation extends, till the quantity, we have seen, is often very great \*. Sir Everard Home, in a *Treatise on the properties of Pus*, has shown how readily irritation of secreting surfaces produces it, independently of any breach of substance. Less frequently small vessels, in consequence of their being debilitated by sympathy with the state of the stomach, as sometimes happens in the vessels of the brain, give way, which prevents the inflammatory action, so that the expectorated matter presents no degree of the purulent appearance, but is occasionally mixed with blood.

The symptoms now assume a more formidable character, the tendency to fever in particular is greater; but it seldom, we have seen, completely puts on the form of hectic. In this stage there is either no breach of substance in the lungs, or the little vessels, which from time to time give way, soon heal. It seems to be at this period, if the disease is about to proceed, that tubercles generally begin to form. These going on to suppuration and ulceration, or the irritated surface of the bronchia and air-cells becoming ulcerated, the last stage commences, in which dyspeptic phthisis is nearly as fatal as any other form of the disease.

This stage is indicated by the aggravation of all the symptoms, particularly by the fever assuming more of the form of hectic, and the expectorated matter occasionally containing both

\* The reader will find many good observations on the tendencies of inflammation of the bronchial membrane in Dr. Hastings's work on this subject.

a pus-like matter and blood ; although it more frequently happens than in other forms of the disease that, where there has been no expectoration of blood at an early period, none appears afterwards. The expectorated matter in different cases, however, occasionally assumes all the various appearances observed in the last stage of other forms of pulmonary consumption.

When death is caused partly by the hepatic and partly by the pulmonary affection, the symptoms of the last stage of pulmonary disease never appear ; and then the most characteristic symptoms for some time preceding death are, great debility, with a very frequent, small, and uncertain pulse, bilious pains, flatulence, and other symptoms of irritation of the stomach and bowels, and often severe fits of dyspnoea of various duration.

This short recapitulation of the symptoms will recall to the reader's mind the circumstances on which the arrangement of the treatment I have adopted is founded.

In the first stage the disease generally yields readily, except the dyspeptic symptoms are peculiarly obstinate (in which case some degree of them has generally been of long standing, or the patient has suffered from former attacks of the disease), or there is such a tendency to a tubercular state of the lungs, that the hepatic affection which I have had occasion to observe always shows itself before indigestion produces phthisis, and this state of the lungs occur almost at the same time.

Such appear to me to be the chief circumstances which sometimes render the disease fatal, even when properly treated, at an early period ; but so generally successful is a proper treatment at this period, that it required many years' observation to convince me that it will not always succeed, and to satisfy my mind respecting the causes of its failure. The last of the causes just mentioned, I am convinced, is the most frequent. It is evident, that when the tendency to tubercles of the lungs is very great, the case approaches to the nature of that form of phthisis which originates in the lungs themselves, whose fatal tendency no mode of treatment, adopted however early, will always prevent ; although as I have pointed out at length in my Treatise on the preservation of health, in a very large proportion even of these cases this may be done, if the first appearance of the disease be carefully watched.

It adds to the unfavourable prognosis in dyspeptic phthisis to find that the patient has such scrofulous enlargement of the more external glands, as can hardly be seen, but may readily be felt. It will be generally admitted, I believe, that external glandular swellings and suppurations often tend to prevent internal disease. We see in the same family some fall a sacrifice to phthisis, while others, labouring under these swellings and suppurations, escape it. I have seen a person, in the last stage of phthisis, saved by the glands of the neck suddenly swelling and suppurating. But that slight enlargement of the external glands, which may rather be felt than seen, while it indicates, is not of sufficient importance to obviate, the tendency to internal disease.

Provided there be no great disposition to tubercles, and the hepatic affection is not unusually obstinate, the first stage of dyspeptic phthisis yields to the usual means of relieving the cough and tendency to fever, combined with the milder parts of the treatment of the second stage of indigestion, particularly such an attention to diet as prevents the stomach being oppressed, and counteracts the inflammatoriness tendency, keeping up rather a freer action of the bowels than is necessary in health, and taking care, by occasional doses of blue pill or calomel, according as the bowels are more or less easily acted on, to preserve a sufficiently copious and healthy secretion of bile.

I have generally given the mercurial, for the most part, one grain of calomel combined with the compound extract of colocynth, when the bowels were languid, in other cases three or four grains of the blue pill, every second or third night, desiring the patient not to go out the next day, till it shall have passed off, and if it does not pass off in a couple of hours after rising, to assist it by an aperient draught. This part of the plan must be pursued till the secretion of bile becomes healthy, and the cough subsides. It ought then to be discontinued, and resumed, if rendered necessary by the disordered state of this secretion, and the recurrence of the cough.

By waiting a couple of hours in the morning previous to giving the opening draught, too great an effect is avoided, and the operation of the mercurial on the liver better secured; both of which is more necessary here, than in the first stage of indigestion; where we have seen it is often more our object to

obtain a very free evacuation, and only the most transitory effect of the mercurial.

The less stimulating stomachic medicines have generally been used, particularly when the appetite was much impaired.

All of this class of medicines which possess any considerable degree of heating quality, have appeared objectionable. Even gentian, so useful in the first stage of indigestion, seems often to increase the cough and the tenderness of the epigastrium. I have found extract of camomile-flowers, combined with small quantities of the powder or oil of caraway, among the best stomachics in such cases; and, unless the strength be much reduced, Epsom salts and senna have appeared to be the best assistant to the cathartic effects of the mercurial. The mercurial I have given, as appears from what has just been said, not for the purpose of moving the bowels, but improving the state of the bile, and therefore only in small doses.

The second stage of dyspeptic phthisis requires a plan of treatment essentially different from the foregoing. When the disease has been neglected till this stage commences, which is not unfrequently the case, or we find that, notwithstanding the employment of the above means, the expectorated matter begins to assume a purulent appearance, or to be mixed with blood, the tenderness in the region of the stomach continuing, and an unhealthy secretion of bile constantly recurring, we may be assured that the foregoing means will probably be ineffectual.

The following is the plan which, under such circumstances, I have for many years adopted, and the efficacy of which originally induced me to offer my observations on this subject to the attention of the public. It consists of a combination of the most decisive treatment of the second stage of indigestion with that of phthisis. We are here to recollect, that while it is even of greater importance than in simple indigestion to save the strength, it is of still greater to expedite the cure. The most to be apprehended from delay in the former case is an increase in the severity and obstinacy of the dyspeptic symptoms; but in the latter, the structure of the lungs is threatened, and, if the cause of injury cannot be removed, will soon yield to the disease.

Half a grain of the blue pill, combined with some mild sto-

machic, has been given three or four times in the course of twenty-four hours, and continued either till the fulness and tenderness of those parts of the abdomen above pointed out yielded, and a proper secretion of bile was restored; or the gums appeared a little redder and fuller than natural.

I have already had occasion to point out the advantages arising from mercury given in minute and frequently repeated doses. There is no case in which they are more conspicuous than in that before us. As the fulness and tenderness abate, and the state of the alvine discharge improves, in the majority of cases the pulmonary symptoms gradually disappear.

With the foregoing plan I have always combined means for the purpose of more directly relieving the tenderness. If it be slight, a succession of small blisters applied over the tender part is often sufficient. If considerable, the blisters should be preceded by the loss of from two to four ounces of blood from this part, from which, if there be much hardness of pulse, although the tenderness be not considerable, great advantage generally arises. When the disease is obstinate, or has repeatedly recurred, a permanent discharge from the tender part, especially that by a seton, often essentially promotes the cure.

By these means the quantity of mercury required is much lessened. If the tenderness be very great indeed, no quantity will succeed, unless we reduce the inflammatory action.

For the purpose of lessening the quantity of mercury, I have also combined with it such other means as tend to promote a regular and healthy secretion of bile.

The external use of the mineral acids too much disposes to inflammation to be employed in the case before us. Saline aperients, more or less, promote a due action of the liver, and are, therefore, preferable to other aperients, provided they are equally suitable in other respects; but of the means which I have employed with this view in dyspeptic phthisis, none has appeared equal to the dandelion. It ought always, perhaps, to be given in some form or other in this disease, if the stomach can bear it in large doses.

When the patient can take a decoction of it poured upon camomile-flowers for his common drink; or, what I have found better, can gradually increase the dose of the fresh expressed juice to one or two table-spoonfuls, taken in camomile-tea,

three times a day; its beneficial effects are frequently very striking. If it tend to oppress the stomach, advantage often arises from infusing bruised cloves with the camomile-flowers. When the dandelion could be taken in either of these ways, a third part of a grain of the blue pill has been given three times a day; and I think as much effect may be expected from this dose, as from the larger doses without the dandelion.

I have also, particularly where the pulse was very hard, occasionally seen great advantage in irritable habits from giving with the mercurial, small doses of the tincture of colchicum, repeated three or four times a day: and it is of great use in all cases to allay the feverish heat by nitrate of potash or saline draughts.

If neither the tenderness be removed, nor the gums a little affected by the above plan in about a fortnight, I have gradually increased the quantity of the blue pill till one of these effects took place. If either take place without relieving the pulmonary symptoms, the prognosis is bad. If the tenderness continue, the hepatic affection is unusually obstinate; if this be wholly removed without materially relieving the pulmonary symptoms, we have reason to believe that the disease has made great progress in the lungs.

It is surprising from what states the lungs will sometimes recover, when relieved from the irritation of the hepatic affection. I have seen some recover, not only whose friends, but whose physicians, had lost hope of them. But in these cases the proper means had not been tried; if these have failed, the hope is no better than in other species of phthisis.

Where the failure of relief proceeds from the obstinacy of the hepatic affection, some hope arises from a fuller mercurial course, but it is often fallacious; for, although such a plan as I have recommended may be pursued without any diminution of strength, and is often, by relieving the disease, attended with an improvement of it; a freer use of mercury, if its advantage be not immediately apparent, will generally be found hurtful.

It sometimes happens that the tenderness is wholly, but the pulmonary symptoms only partially, relieved by the above plan. In this case the hepatic affection is apt to recur, always bringing with it an increase of the pulmonary symptoms, till

the structure of the lungs is at length destroyed. Here, if the recurrence of the hepatic affection be neglected, the fatal termination is rapid. If it be carefully watched, and relieved as soon as it appears, the case is protracted, and the decline of the patient gradual. I have known cases, where the progress of the disease had by such means been so retarded, that there was little increase in it in the space of several months, prove rapidly fatal on the adoption of another plan.

But the most fatal case is when the hepatic affection finally disappears, the seat of the disease being wholly transferred to the lungs, as happens frequently in the last stage of this species of phthisis. In this case there is no hope; while the hepatic affection continues to recur, there is always some hope, however small, that, on its final removal, the lungs may rally.

With respect to the parts of the treatment which are common to dyspeptic and other forms of phthisis, I have little to offer in speaking of the former. The various means found useful in other cases of this disease are applicable here, as far as they do not tend to renew or increase the affection of the digestive organs. I think I have found a combination of the extracts of white poppy and conium the best anodyne. Opium is more inclined to constipate the bowels and retard the due flow of bile, and the anodyne power of the hyosciamus, in such doses as are safe, is not to be depended on.

When the tenderness is considerable, much animal food and fermented liquors are injurious.

Some suppose that mercury is often useful in phthisis originating in the lungs. I have never found it so; but I think, when it has been employed in such cases on account of other diseases being complicated with them, it has almost always proved hurtful. I have remarked that in this form of the disease it never seems to improve the strength, as it often does in dyspeptic phthisis, by improving the digestion. In it the digestion is generally good, and we have nothing to compensate for the debilitating tendency of the mercury.

If there be any case of idiopathic phthisis in which mercury is proper, it is one which I have already had occasion to mention, in which the pulmonary disease produces disease of the digestive organs; of which we still find hepatic affection the prominent feature, and which always tends to aggravate the

original disease. I have not, however, found it useful in such cases, which I think may be easily explained. In them the pulmonary affection is far advanced before the affection of the digestive organs appears, and both on this account and because the former is the original disease, it cannot be removed by removing the latter. Besides, it is not likely that a mild course of mercury will remove the hepatic disease, while the cause which produced it still continues to operate; and a more powerful one, if it be capable of removing it, is here out of the question.

If what has been said in the foregoing observations on dyspeptic phthisis be correct, the principle of treatment in other similar organic diseases, which have the same origin, may easily be inferred.

We must combine the treatment of the second stage of indigestion with that necessary in the disease which has supervened, never losing sight of the former; for, however much the affection of the digestive organs may be relieved by the establishment of another disease, it is always apt to recur; and as far as I have observed, the recurrence of the primary rarely tends to relieve, and generally aggravates, the sympathetic disease, unless it recur in consequence of the abatement of the latter.

## CHAPTER II.

### *Of Habitual Asthma.*

I HAVE already had occasion to make some observations on this disease, and to mention generally the means of relief which I have found most effectual.

We have seen that indigestion sometimes so affects the nervous system, or some particular part of it, that permanent nervous debility, either general or partial, with little affection of the sanguiferous system, ensues.

This is particularly apt to happen in the lungs when indigestion has been long attended with much difficulty of breathing, which, it was observed, sometimes remains with a tendency to cough, after all the other symptoms have disappeared, and is often but little influenced by medicine.

It appears from experiments related in an *Inquiry into the Laws of the Vital Functions*, to which I have frequently had occasion to refer, that after the nervous influence of the lungs and stomach have been greatly impaired by dividing the eighth pair of nerves, and folding back one of their divided ends, in consequence of which digestion is suspended, and the breathing rendered difficult; the animal can be made to breathe with freedom and digest his food by sending the galvanic influence through the lungs and stomach\*.

\* See an Account of a Repetition of these Experiments, with a confirmation of their results, in the *Medical and Physical Journal for May, 1820*; By Clarke Abel, M.D., F.R.S., &c.

Since the publication of the first edition of this Treatise they have again been repeated, in consequence of several gentlemen still thinking that their results required further confirmation. The following is the very candid account of the results given by one of these gentlemen, Mr. Broughton.

Having stated that the eighth pair of nerves had been divided in the neck of three rabbits, pains having been taken to keep their divided extremities at a distance from each other, and one of the rabbits subjected to the influence of the voltaic battery, he observes:

“The galvanised rabbit had remained singularly quiet the whole time, breathing freely, and with no more apparent distress than the twitches usually produced by the galvanic influence, which in this case was uninterruptedly kept up. The other rabbits laboured strongly in their breathing. They were all three killed at the same period, and their stomachs successively opened. In the two non-galvanised rabbits, digestion had *scarcely made any progress*, but in that galvanised, *it was perfect*, in the manner, to all appearance, avowed by Dr. Wilson Philip and his supporters. However we may differ in opinion, as to the real state of the food in the non-galvanised rabbits, as to Dr. Wilson Philip’s theory, or, as to the cause of the formation of chyme and chyle being found under the influence of a galvanic battery, Dr. Wilson Philip cannot be denied the merit of correctness in his assertions (hitherto almost universally distrusted), relative to the simple fact of a certain power of galvanism producing digestion, after dividing the eighth pair of nerves, under circumstances in which it is impeded without the galvanism.

“It is proper to state that the President and several members of the Royal Society, and of the Colleges of Physicians and Surgeons, among whom were Mr. Brodie and myself, inspected the progress of these experiments, which were carried on under the constant superintendence of Dr. Wilson Philip.”—See the Twenty-second Number of the *Journal of the Royal Institution*, pages 326-7.

Mr. Broughton also admits that the experiments afforded reason to believe, that the nervous influence passed by nerves after they had been divided; and it has from experiments since made been admitted by Mr.

It is an inference from my own experiments and observations \*, as well as those of others, particularly of M. le Gallois, that what is called the nervous system, comprehends two distinct systems, the sensorial, and the nervous system properly so called. Now, we have no reason to believe that galvanism can perform any of the functions of the sensorial system ; yet, in the greater number of instances in which it has been used in medicine, it has been expected to restore the sensorial power. It has been expected to restore hearing, and sight, and voluntary power. It may now and then happen in favourable cases, from the connexion which subsists between the sensorial and nervous systems, that by rousing the energy of the latter, we may excite the former ; or the sensorial power may be entire, and the fault in the nerves which convey its influence. From our experience of such cases, however, there seems little reason to hope that galvanism will often be successful in them. We have reason to believe, from the experiments related in the inquiry just referred to, that galvanism has no other power

Brodie and Mr. Cutler, the gentlemen who were so good as to assist me in these experiments, that this may happen although the divided ends be separated by the distance of a quarter of an inch, provided the nerves be not otherwise displaced.—See two papers relating to this subject which the Royal Society did me the honour to publish, one in the *Philosophical Transactions* of 1817, entitled “ On the effects of Galvanism in restoring the due action of the lungs,” the other in those of 1822, entitled, “ Some Positions respecting the Influence of the Voltaic Battery in obviating the effects of the division of the eighth pair of nerves.”—See, also, a paper in the Twenty-third Number of the *Journal of the Royal Institution*.

The experiments here referred to have lately been repeated on a large scale at Paris by M. Breschet and other physiologists, with a confirmation of their results, both with respect to the power of galvanism in renewing the digestive process after it had been interrupted by the division of the eighth pair of nerves, and the separation of their divided extremities ; and with respect to the passage of the nervous influence after the division of the nerves, unless part of the nerve be removed or the divided ends displaced.—See “ *Recherches Expérimentales sur les Fonctions du Système Nerveux, 1<sup>er</sup> Mémoire ; de l’Influence du Système Nerveux sur la Digestion Stomachale,*” par M. Breschet, D.M.P. “ *Chef des Travaux anatomiques de la Faculté de Médecine de Paris, etc.,* H. Milne Edwards, D.M.P., et Vavasseur, D.M.P.” (“ *Mémoires lu à la Société Philomatique le 2 Août, 1823.*”) “ *Extrait des Archives Générales de Médecine, Août, 1823.*”

\* See *Experimental Inquiry*, chap. x, and the experiments there referred to.

over the muscular system than that of a stimulant\*; we are, therefore, to expect little more advantage from it in diseases depending chiefly on faults of the sanguiferous system, than from other stimulants. But I cannot help regarding it as ascertained, that in those diseases in which the original cause of derangement is in the nervous system properly so called, where the sensorial functions are entire, and the vessels healthy, and the power of secretion, and other assimilating powers, which seem immediately to depend on the nervous system, are alone in fault, galvanism will often prove a valuable means of relief.

As soon as the foregoing view of the subject presented itself, I was led to inquire what diseases depend on a failure of nervous influence. The effect on the stomach and lungs, of dividing the eighth pair of nerves†, answered the question respecting two of the most important diseases of this class. We have seen, that withdrawing a considerable part of the nervous influence from the stomach and lungs suspends the digestive powers, and produces great difficulty of breathing.

When the effect of depriving the lungs of a considerable part of their nervous influence is carefully attended to, it will be found, I think, in all respects similar to the dyspnœa which often attends indigestion, and which, when it remains after the other symptoms have disappeared, I have called habitual asthma. In this disease the breathing is constantly oppressed, better and worse at different times, but never free, and often, we have seen, continues to get worse in defiance of all the usual means.

It appeared, from repeated trials, that the oppressed breathing, caused by the division of the eighth pair of nerves, may be prevented by sending the galvanic influence through the lungs‡. That this may be done with safety in the human body we know from numberless instances, in which galvanism has been applied to it in every possible way.

Such are the circumstances which led me to expect relief from galvanism in habitual asthma. Although many others have now made trial of its effects in this disease, I shall

\* Compare the experiments related in the first and second chapters of the second part of the Inquiry just referred to, with Exp. 70, 71, 72, 73, and the observations which follow the account of them.

† *Exp. Inq.* Exp. 44, 45.

‡ *Exp.* 70, 71, 72, 73.

mention nothing in the following pages which did not come under my own observation.

I have employed galvanism in many cases of habitual asthma, and almost uniformly with relief; and have found this affection of the breathing as readily relieved when it appeared as a primary disease, as when it succeeded to indigestion.

The time, during which the galvanism was applied before the patient said that his breathing was easy, has varied from five minutes to a quarter of an hour. I speak of its application in as great a degree as the patient could bear without complaint. For this effect I latterly found from eight to sixteen four-inch plates of zinc and copper, the fluid employed being one part of muriatic acid, and a hundred and twenty of water, sufficient. Some require more than sixteen plates, and a few cannot bear so many as eight; for the sensibility of different individuals to galvanism is very different. It is curious, and not easily accounted for, that a considerable power, that, perhaps, of twenty-five or thirty plates, is often necessary on first applying the galvanism, in order to excite any sensation; yet, after the sensation is once excited, the patient shall not, perhaps, particularly at first, be able to bear more than six or eight plates.

The stronger the sensation excited, the more speedy in general is the relief. I have known the breathing instantly relieved by a very strong power. It has generally been made a rule to begin with a very weak one, and increase it gradually at the patient's request, by moving one of the wires from one division of the trough to another, and moving it back again when he complained of the sensation being too strong. It is convenient for this purpose to charge with the fluid about thirty double plates.

The galvanism was employed in the following manner. Two thin plates of metal about two or three inches in diameter, dipped in water, were applied, one to the nape of the neck, the other to the central part of the abdomen, and rather lower than the pit of the stomach. The wires, from the different ends of the trough\*, were brought into contact with these plates, and, as observed above, as great a galvanic power

\* I found a trough, of the old construction, more effectual in restoring the due action of the lungs than the improved pile. I was at first at a loss

maintained as the patient could bear without complaint. In this way the galvanic influence was sent through the lungs, as much as possible, in the direction of their nerves. It is proper constantly to move the wires upon the metal plates, particularly the negative wire, otherwise the cuticle is injured in the places on which they rest\*. The relief seemed much the same, whether the positive wire was applied to the nape of the neck, or the pit of the stomach. The negative wire generally excites the strongest sensation. Some patients thought that the relief was most speedy, when it was applied to the abdomen.

The galvanism was discontinued as soon as the patient said that his breathing was easy. In the first cases in which I used it, I sometimes prolonged its application for a quarter of an hour, or twenty minutes, after the patient said he was perfectly relieved, in the hope of preventing the early recurrence of the dyspnœa; but I did not find that it had this effect.

It is remarkable, that in several who had laboured under oppressed breathing from ten to twenty years, it gave relief quite as readily as in more recent cases; which proves, that this habitual difficulty of breathing, even in the most protracted cases, does not arise from any change having taken place in the more evident mechanism of the lungs.

to account for this circumstance. From many observations, I have now reason to believe, that it arises from such effects of galvanism, like its other effects on the animal body, being proportioned, less to the quantity of electricity supplied by the trough, than to the intensity of its electrical and quantity of its chemical power, both of which are proportioned rather to the number of plates, than to the extent of surface.

I have repeatedly tried the effects of a powerful electrical machine, in habitual asthma. They are considerable, but inferior to those of the voltaic trough; which I would ascribe to the former possessing much less chemical power, in proportion to the intensity of its electricity than the latter. The most powerful electrical battery will not readily decompose water, without the ingenious arrangement suggested by Dr. Wollaston for concentrating, as much as possible, its electrical power, while the power of a few voltaic plates is, without any precaution, sufficient for this purpose.

I have lately found a trough, composed of plates two inches by three, nearly, or altogether, as effectual as one of plates four inches square.

There is reason to believe that plates of an inch and half or two inches square, would answer medical purposes nearly as well as larger ones.

\* The skin is less apt to be injured, if, instead of the bits of metal, it is defended by many folds of wet rag. When this method is adopted, rather a stronger galvanic power is required to produce the same sensation.

With regard to that form of asthma which returns in violent paroxysms, with intervals of perfectly free breathing, I should expect little advantage from galvanism in it; because I found that the peculiar difficulty of breathing, which occurs in this species of asthma, cannot be induced in animals, by diminishing the nervous influence of the lungs. It is probable, that in the human subject the cause of this disease is spasm, from which, indeed, it takes its name; and we have no reason to believe, from what we know of the nature of galvanism, that it will prove the means of relieving any affection of this kind.

Galvanism is sometimes useful in protracted cases of spasmodic asthma, when the fits have become less severe, and more or less difficulty of breathing is almost constantly present; in short, when the spasmodic has assumed a good deal of the form of habitual asthma. Even in these cases, however, as far as my experience has gone, the relief afforded by it is very imperfect, and of short duration. It is often such, however, as very sensibly aids other means.

The spasmodic asthma is comparatively a rare disease, not one case of it occurring for at least twenty of habitual asthma.

Of the first cases of habitual asthma which I saw, many occurred in work-people of the city where I then resided, who had been obliged to abandon their employments in consequence of it, and some of them, from its long continuance, without any hope of returning to regular work. Most of them had tried the usual means in vain. By the use of galvanism they were relieved in different degrees, but all sufficiently to be restored to their employments. I afterwards saw several of them, who, although they had not used galvanism for many months, said they had continued to work without inconvenience. Some, in whom the disease had been wholly removed, remained quite free from it; some had had a return of it, and derived the same advantage from galvanism as at first.

The application of galvanism was confined to asthmatic difficulty of breathing. In all inflammatory cases it would be injurious; and in cases arising from dropsy, or any other mechanical impediment, little or nothing, it is evident, is to be expected from it.

If the secretion of bile continue to be disordered, and there is much tenderness on pressure, the means which have been

pointed out in the first part of this Treatise must be employed for the purpose of relieving these symptoms previous to the use of galvanism; and to these means alone the dyspnœa sometimes yields; but I have learned, from a pretty extensive experience, that in a large majority of such cases it will resist them, yet readily admit of relief from galvanism.

If there be little inflammatory tendency, galvanism is also a means of relieving the affection of the digestive organs. In all the cases where habitual asthma was complicated with symptoms of indigestion, the latter as well as the former were relieved by it. I have repeatedly seen from it the same effect on the biliary system which arises from calomel; a copious bilious discharge from the bowels coming on within a few hours after its employment. This seldom happens except where there appears to have been a failure in the secreting power of the liver, or a defective action in the gall-tubes.

I have not found that the presence even of a severe cough, which is common in habitual asthma, in which there is always more or less cough, counter-indicates the use of galvanism. The cough, under its use, generally becomes less frequent in proportion as the accumulation of phlegm in the lungs is lessened; but it seems to have no direct effect in allaying it. During the application of the galvanism, the patient is often excited to cough up the phlegm which is oppressing the lungs. It is frequently, however, removed by this influence without being coughed up.

In some cases the cough continued troublesome after the difficulty of breathing had disappeared. Galvanism never appeared to increase it, except when the inflammatory disposition was considerable. In the most chronic form of pulmonary consumption, where the symptoms had lasted for several years, and an habitual asthma had supervened, I have seen the relief obtained from galvanism very great, notwithstanding some admixture of a pus-like substance in what was expectorated. In these cases it relieves the breathing, leaving the other symptoms little changed. I need hardly add, after what has been said, that in ordinary cases of this disease nothing could be more improper than the use of galvanism.

The difficulty of breathing arising from pulmonary consumption, and that from habitual asthma, are easily distinguished. The former is less variable. It is generally increased

by the exacerbations of the fever, and always by exercise. When the patient is still and cool, except in the last stages, his breathing is generally pretty easy; and it is seldom much influenced by changes of the weather, except they increase the inflammatory tendency. The latter is worst at particular times of the day, and frequently becomes better and worse without any evident cause: and at the times when it is better, the patient can often use exercise without materially increasing it. Its exacerbations are unaccompanied by any increase of fever; and changes of the weather influence it much. It is particularly apt to be increased by close and foggy weather.

When there is a considerable tendency to inflammation in habitual asthma, the repeated application of galvanism sometimes increases it so much, that relief can no longer be obtained till the inflammatory tendency is subdued by local blood-letting. It always gives relief most readily, and the relief is generally most permanent, in those cases which are most free from inflammatory tendency, and least complicated with other diseases, the chief complaint being a sense of tightness across the region of the stomach, impeding the breathing.

The patients remarked that the sense of tightness gradually abated while they were under the influence of the galvanism, and that as this happened their breathing became free. The abatement of the tightness is often attended with a sense of warmth in the stomach, which seems to come in its place. This sensation is most frequently felt when the negative wire is applied near the pit of the stomach, but the relief does not seem less when it is not felt.

With respect to the continuance of the relief obtained by galvanism, it is different in different cases; in the most severe cases it does not last so long as in those where the symptoms are slighter, though of equal continuance. This observation, however, does not universally apply. Some part of the relief obtained is generally permanent, and the patient generally feels its temporary effects for twenty-four hours. In almost all, the repetition of the galvanism gradually increases the permanent relief, but its increase is much more rapid in some cases than in others.

The permanency of its good effects in the disease before us, has appeared very remarkably in several cases where the symptoms, after having been removed by it, were renewed after intervals

of different duration, by cold or other causes. In these cases, means, which previous to the use of galvanism had failed to give relief, were now successful without its aid, or with few applications of it compared with those which had been necessary in the first instance. I have not yet seen any case, in which galvanism had been of considerable advantage, where its good effects appeared to have been wholly lost. Taking cold, and the excessive use of fermented liquors, have been the principal causes of relapse.

The galvanism has seldom been used more than once a day. In some of the more severe cases it was used morning and evening. About a sixth part of those who have used it appear, as far as I yet know, to have obtained a radical cure. It in no case failed to give more or less relief, provided there was little inflammatory tendency. It failed to give considerable relief only in about one-tenth; I may add, that were it only the means of present relief, being more innocent, it would be preferable to the heating, spirituous, and soporific medicines, which are so constantly employed in this disease.

As a very small galvanic power, that of not more than from four to six three-inch double plates, often relieved the dyspnœa, may we not hope that a galvanic apparatus may be constructed, which can be worn by the patient, of sufficient power to prevent its recurrence in some of the cases in which the occasional use of the remedy does not produce a radical cure?

I wished to try if the impression on the mind, in the employment of galvanism, has any share in the relief obtained from it. I found that by scratching the skin with the sharp end of a wire, I could produce a sensation so similar to that excited by galvanism, that those who had most frequently been subjected to this influence were deceived by it. By this method, and arranging the trough, pieces of metal, &c., as usual, I deceived several who had formerly received relief from galvanism, and also several who had not yet used it. All of them said that they experienced no relief from what was done.

Without allowing them to rise, I substituted for this process the real application of galvanism, merely by immersing in the trough, without their knowledge, one end of the wire with which I had scratched the nape of the neck, the wire applied below the pit of the stomach having been all the time managed as usual by the patients themselves. Before the application

of the galvanism had been continued as long as the previous process, they all said they were relieved. I relate the particulars of the two following experiments, because they point out two circumstances of importance in the application of galvanism in asthmatic cases, and in judging of its *modus operandi*.

The first was made on an intelligent lady, of about thirty-five years of age, who had for many years laboured under habitual asthma. Her breathing was very much oppressed at the time that she first used galvanism. The immediate effect was, that she breathed with ease. She said she had not breathed so well for many years. Part of the relief she obtained proved permanent, and when she was galvanised once a day for about ten minutes, she suffered little dyspnœa at any time. After she had been galvanised for eight or ten days, I deceived her in the manner just mentioned. The deception was complete. She told me to increase or lessen the force of the galvanism, as she was accustomed to do, according to the sensation it produced. I obeyed her directions by increasing or lessening the force with which I scratched the neck with the wire. After I had done this for five minutes, she said the galvanism did not relieve her as usual, and that she felt the state of her breathing the same as when the operation was begun. I then allowed the galvanism to pass through the chest, but only through the upper part of it, the wire in front being applied about the middle of the breast-bone. She soon said that she felt a little relief; but although it was continued in this way for ten minutes, the relief was imperfect. I then directed her to apply the wire in front to the usual place, so that the influence might pass through the whole extent of the chest; and, in a minute and a half, she said her breathing was easy, and that she now experienced the whole of the effect of the former applications of the remedy.

To try how far the effect of galvanism in asthma arises merely from its stimulating the spinal marrow, in a young woman who had been several times galvanised in the usual way, the wires were applied to the nape of the neck and small of the back, and thus the galvanic influence was sent along the spine for nearly a quarter of an hour. She said her breathing was easier, but not so much so as on the former applications of the galvanism; and on attempting to walk up stairs she began to pant, and found her breathing, when she had gone about

half way, as difficult as before the galvanism was applied. She was then galvanised in the usual way for five minutes: she now said her breathing was quite easy, and she walked up the whole of the stairs without bringing on any degree of panting, or feeling any difficulty of breathing. The foregoing experiment was made in the presence of four medical gentlemen. This patient, after remaining free from her disease for about half a year, returned to the Infirmary, labouring under a slighter degree of it, and experienced immediate relief from galvanism. The disease seemed to have been renewed by cold, which had at the same time produced other complaints. This is one of the cases above alluded to in speaking of the permanency of the good effects of galvanism. On the return of this patient to the Infirmary, two or three applications of galvanism, combined with means which had given no permanent relief to the dyspnœa previous to her first using this remedy, now removed it. When she first used it, its constant employment once or twice a day for several weeks was required to produce the same effect.

Many medical gentlemen, I have already had occasion to observe, have frequently witnessed the relief afforded by galvanism in habitual asthma; and Mr. Cole, the house surgeon of the Worcester Infirmary, authorizes me to say, that no other means there employed have been equally efficacious in relieving this disease.

In the foregoing account of habitual asthma, I have entered more fully than would otherwise have been necessary, into its diagnostic symptoms; because it has not, in general, been particularly distinguished from other species of difficulty of breathing; nor indeed considered as a distinct disease, although it often appears as such.

THE effects of galvanism in improving the function of the stomach are hardly less striking, although generally more gradual. The removal of the asthmatic affection, in the cases I have been speaking of, no doubt contributes to the more healthy action of the digestive organs, by enabling the patient to use exercise\*; but I have seen the morbid state of the bile

\* The effect of indolence, in painful diseases, is often much less injurious than in health. Pain, if not so great as to overpower, in some degree, comes in place of exercise, in preserving the general activity of the functions.

and other symptoms of indigestion relieved by galvanism in cases where there was no affection of the breathing, and where all the usual means, and even small, and frequently repeated alterative doses had failed.

In some, galvanism, at the time of its application, occasions a tendency to sighing; and in some, in whom it removed the dyspnœa, it seemed to occasion a permanent sense of sinking referred to the pit of the stomach. This was easily relieved by small doses of carbonate of iron and bitters, without any return of the dyspnœa. Galvanism generally gave a great degree of relief to the dyspnœa, when it produced this effect.

In my *Inquiry into the Laws of the Vital Functions*, the reader will find cases related, in which habitual asthma and indigestion were relieved by galvanism, and some in which it wholly removed these diseases.

I SHALL beg leave to give the following extract from a paper which the Editor of the Journal of the Royal Institution did me the honour to publish in the 25th, 26th, and 27th numbers of that work, as strikingly illustrating both what is said in the present chapter, and that, relating to symptomatic indigestion in the second part of this Treatise.

“ If the foregoing inferences from the various experiments which have been referred to be correct, it is reasonable to suppose that they may be beneficially applied to the practice of medicine. The view of the different functions of the animal body, and their mutual dependence on each other, afforded by those experiments, cannot in that case fail to be of use in explaining the nature and regulating the treatment of the deviations of these functions from the healthy state, particularly in the diseases whose progress is most influenced by the mutual sympathy of the vital organs.

“ In a Treatise on Indigestion, I have attempted its application to an extensive class of these diseases. But I here wish chiefly to direct the reader’s attention to the practical results from the experiments which relate to the influence of galvanism on the vital organs.

“ They led me more than six years ago to the employment of this agent, in diseases, which seem to arise from a defect of nervous power, particularly habitual asthma and indigestion; and an account of its effects in those diseases was published in

the *Philosophical Transactions* of 1817. It is now admitted, I believe, by all who have witnessed them, that in the former disease, and under certain circumstances of the latter, galvanism is the most effectual means of relief which we possess.

“ In its employment, we must constantly guard against the inflammatory diathesis, both because it tends to produce this diathesis, and because the diseases to which it is adapted, for reasons pointed out at length in the *Treatise on Indigestion*, to which I have just referred, have the same tendency. As any considerable degree of the inflammatory diathesis not only obviates the beneficial effects of galvanism, but renders it injurious, the constant superintendence of a well-informed practitioner is necessary. To the effects of galvanism in one case of considerable importance I shall beg leave more particularly to direct the reader’s attention, because it is only since I last had occasion to mention the subject publicly, that I have witnessed them. Mr. Earle some time ago asked me, if I thought galvanism a probable means of relief in the dyspnœa and indigestion which arise from disease of the spinal marrow. I did not hesitate to recommend a cautious trial of it, referring Mr. Earle to what I had said of such cases in the last part of the above-mentioned *Inquiry*. I am happy to say the result has fully answered our expectations, as appears from the following letter which Mr. Earle did me the favour to address to me :—

“ *George-street, August 14, 1822.*

“ My dear Sir,

“ I have much pleasure in transmitting to you the following account of the trials made with galvanism at St. Bartholomew’s Hospital. The first case is that in which you witnessed its first application.

“ Elizabeth Pepperall, aged 17, of fair complexion, and light hair, was admitted into St. Bartholomew’s Hospital in August, 1821, in consequence of an affection of the spine, which had existed for about a year and a half. At the time of her admission, it appeared, that almost all the dorsal and lumbar vertebræ were affected. She had nearly lost all power over her lower extremities and pelvic viscera; and she complained of very severe cramps at the pit of the stomach, and acute pain in the course of the costal nerves, which was much

increased by pressure on the ribs, or any attempt at a deep inspiration. Her general health was much deranged; her pulse was very rapid, with, occasionally, severe palpitation of the heart, and constant dyspnœa. Her digestive powers were greatly impaired; she had no appetite, and could only digest a small portion of stale bread, and some milk and water. Even this meal was always followed by uneasy sensations at her stomach, and an increase of head-ach, from which she was hardly ever free. Her bowels were obstinately costive, and the urine was scanty, and deposited large quantities of lithate of ammonia.

“ She was placed on one of my invalid beds, which enabled her to remain in a state of uninterrupted rest; and after the repeated application of leeches, issues were made on either side of the dorsal spine, and subsequently in the lumbar region. The issues were kept actively open, and the strictest attention was paid to her general health. The spine very gradually became less sensible, and the power over the pelvic viscera and lower extremities slowly returned; still, however, her stomach was incapable of digesting any other food than bread and milk and water, her head-ach remained nearly unabated, and her breathing was habitually difficult. She was in this state when you saw her, and the galvanism was first administered (December 19).

“ A trough containing plates of about three inches was employed. The positive wire was applied to the nape of the neck, the negative a little below the pit of the stomach. No sensation was at first produced by twenty plates; but after the sensation was excited, she could not endure more than twelve. The first sensation she experienced caused her to take involuntarily a sudden and deep inspiration. The galvanism was applied for about a quarter of an hour, at the end of which time her breathing became much freer than it had been for many months. Of this she repeatedly expressed herself perfectly certain, at the same time she felt considerable uneasiness at the stomach. She was slightly hysterical, in consequence of the agitation she had experienced, but her breathing was tranquil during the whole evening.

“ With a view to remove the tenderness in the epigastrium, leeches were applied to the region of the stomach, and the whole plan of treatment adapted to the second stage of in-

digestion was resorted to. When the tenderness had somewhat abated, the galvanism was repeated with more decided relief to the breathing, and without causing much uneasiness at the stomach.

“ After several applications of it, the relief she experienced in her breathing lasted for two or three days, and at length it was only necessary to repeat it occasionally. The effect of its administration was uniformly the same; a most sensible and speedy relief from a state of anxious breathing to perfect ease and repose. Its beneficial effects were not, however, confined to the respiration; the powers of her stomach greatly improved, and she was able to digest a small quantity of meat or the yolk of an egg without pain. As her stomach improved, she lost the distressing head-ach, which had so constantly attended, as at one time to lead me to apprehend the existence of disease in the brain, having met with other cases in which scrofulous affection had existed in the brain and spine at the same time. Her progress from this time was uniform, and far more rapid than it had been before; and in about two months, the catamenia, which had been suspended from the commencement of the disease, returned.

“ The patient was sufficiently recovered to leave the hospital and return to her friends at Dartmouth early in July; at which time she was able to walk with very little assistance, and without experiencing the least pain in her back. On reviewing the circumstances of this case, I have not the least hesitation in stating my decided opinion of the great benefit which was derived from the employment of galvanism, not only in affording temporary relief to the breathing, but in improving the secretions, and thus materially contributing to the ultimate recovery of the patient. I feel particularly happy that the patient was in a public hospital, and that the means were employed in the presence of many intelligent medical friends and pupils, who were all equally satisfied with myself with the essential and permanent benefit which she derived from the administration of galvanism.

“ It was employed in two other similar cases in the same hospital, those of Ann Baillies, and Maria May, in which it produced similar good effects, except that in one of these, the improvement of the general health, although not less than in the other cases, did not appear to have the same beneficial

effect on the disease of the spine. It was tried in another case of spine disease, which was attended with fits of spasmodic asthma. These, as I was taught to expect, from the observations you have published on this subject, it failed to relieve. It is remarkable, that in the case of Ann Baillies, in which the pulse was from 140 to 150, and very weak, the use of the galvanism always rendered it stronger, and brought it down from thirty to forty beats in the minute.

“ From observing the good effects of galvanism on the secretions of the stomach, I was induced to make a trial of it in a case of deafness, accompanied with a total want of secretion of cerumen in the right ear. Its first application produced a watery secretion, which by perseverance gradually assumed the taste and all the other characters of cerumen. The hearing was greatly improved in both ears, but how far this was to be ascribed to the restoration of the secretion is rendered doubtful, in consequence of a tumour having at the same time been removed from the tympanum of the left ear by the repeated application of caustic.

“ The foregoing facts you are perfectly welcome to make any use of, should you think them deserving of notice ; and I am,

“ My dear Sir,

“ Very sincerely yours,

“ HENRY EARLE.”

It appears, from the foregoing statement, that in disease of the spinal marrow galvanism is not only capable of performing the office of the diseased part of this organ, by which the vital functions are restored to a state of health, and the patient's sufferings greatly mitigated ; but that it also, as might *à priori* be expected, by thus improving the general health, indirectly contributes to the cure of the spinal disease. With regard to the last case mentioned by Mr. Earle, in which the secretion of cerumen was restored by galvanism, this, it is evident, from what has been said, can only happen when the fault consists in a defect of nervous influence, and not in a diseased state of the vessels.

WHEN we compare together the foregoing statements respecting the effects of galvanism in disease, may we not hope

that, if in so few years such has been the result of its employment on the principles above laid down, a more extensive experience will still extend the advantages derived from it? I have repeatedly seen its use more successful than any other means in the obstinate general nervous debility sometimes left by long-continued indigestion, where the whole nerves are in a state analogous to those of the lungs in habitual asthma. In these cases transmission through the stomach and lungs has still appeared to be the best means of applying it. In certain species of fever, and other cases attended with deficient nervous energy, we have reason to believe that it will be found a valuable remedy.

When galvanism is not used to such an extent as to occasion the inflammatory tendency, I have never seen any bad effect from it, except a sense of languor, similar to the feeling of fatigue, when its employment has been too long continued. The inflammatory tendency produced by it, according to my experience, is always easily removed; is never followed by any serious consequence; and, with a little care, may almost always be prevented. I have repeatedly observed, that when the cure has advanced to a certain point, the judicious employment of galvanism, so far from causing the inflammatory tendency, has, by improving the state of the secreting surfaces, relieved that caused by the disease.

It will readily be perceived, from what has been said, how much the indigestion and habitual asthma, arising from affections of the spinal marrow, and the effects of galvanism in relieving them, illustrate what is said in the chapter on symptomatic indigestion.

WHEN the reader reflects, on the one hand, on the influence of the nervous system on every part of our frame, and the manner in which this system is influenced by the state of the digestive organs; and, on the other, on the various phenomena of Indigestion detailed in the foregoing Treatise, the changes it undergoes in its progress, the various forms it assumes from the variety of parts in different cases implicated in its course, and the variety of ways in which each part may be influenced by it; and compares the whole of these circumstances with the observations more directly pointing out its influence on other diseases; he will, I think, find it impossible

not to concur with me in the observation that the principles of the treatment of Indigestion extend more or less to that of certain and very common forms of all the diseases to which we are subject. There is no disease which does not often appear as a sympathetic affection, and there is no important affection of this kind in which the digestive organs are not concerned, and the course of which is not essentially influenced by them.

In the progress of indigestion, we see a state of general nervous irritation followed by that of general inflammatory tendency, the necessary consequence of the continuance of the irritation; and, if the case be allowed to take its course, this general inflammatory tendency often by degrees fixing chiefly, if I may be allowed the expression, on some particular organ, which happens, from the age or constitution of the patient, or from previous injury, to be most exposed to the effects of such a tendency, and the affection of which diverts this tendency from other parts. If under these circumstances, the progress of the disease cannot be arrested by restoring the due function of the digestive organs, in which the origin of the mischief, as well as the cause which supports it resides, the structure of this part at length yielding, the most formidable disease is established, varying according to the position, nature, and function of the organ affected. Such is the origin of a large proportion of organic diseases. By what means are the changes so important in the progress and treatment of so many diseases effected? By the agency of the nervous system, that power by which all the other powers of the animal body are formed into a whole, every part of it influencing every other; in consequence of which the continued irritation of any highly sensible part, may at length be the means of destroying the function of any other, however distant from the original seat of irritation.

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## APPENDIX

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It is now about ten years since I addressed to the members of our profession my observations respecting the nature and treatment of Indigestion, not in the limited sense in which that word is generally understood, but as an affection of the most central, as well as sensible part of our frame, influencing every part of it, and consequently capable of influencing the symptoms and treatment of all its diseases; for, even with respect to the local diseases of its most distant parts, that class which we should suppose least liable to be affected by the state of the digestive organs, no person who has read the invaluable work of Mr. Abernethy can doubt its influence. Some writers, indeed, seem to think that a superficial view of what are called stomach complaints, and a detail of the more evident effects of the common remedies, are all that is necessary in treating of Indigestion; and any more minute inquiry into its nature and effects, they regard as only troublesome, and tending to establish useless and imaginary distinctions; as if an organ which, not more by its position, than its function and its sympathies, may be regarded as the centre of the system, can have its powers impaired, without producing many consequences, only to be traced by careful observation; or as if these consequences were of no use either in understanding or treating its diseases. If a minute knowledge of the laws of the animal economy be necessary to understand the bearings of its various affections, and can it be otherwise, is not correct observation necessary in order to apply that knowledge? The author just mentioned has set an example which, in an age like the present, cannot be lost. We can no longer be satisfied to look only to the stomach and liver in speaking of the morbid states of the former; or commit their cure, under all circumstances, to antacids, bitters, and calomel.

I am induced, here, to enter more fully than I should otherwise have judged necessary, into what I have attempted on the subject of Indigestion, both with respect to the motives of the attempt and its objects, in consequence of some late writers having placed themselves in opposition to it, without, as far as I can judge, having taken the trouble to make themselves acquainted with the principles on which it is founded.

Previous to the publication of this Treatise, I had for more than twenty years employed the time I could spare from the more active duties of the profession, in endeavouring to ascertain the relation which the principal organs of the animal body bear to each other, a subject, which, notwithstanding its importance in the cure of diseases, and the present advanced state of medical science, appeared to be involved in obscurity and contradiction. The progress of this investigation was from time to time reported in the *Philosophical Transactions*, and is more fully detailed in my *Inquiry into the Laws of the Vital Functions*.

Early in the seventeenth century the experiments of Harvey unfolded the nature of the circulation, by which physiologists were every where incited to inquire into the powers which support a function on which the vigour of every other so evidently depends; and, particularly, to ascertain the relations which subsist between it and the functions of the nervous system; and it is not without surprise that we find so little achieved by the labours of so many learned and able inquirers.

Although we see among their names those of Descartes, Borelli, Stahl, Willis, Boerhaave, and many others almost of equal note, little was done which deserves to be recorded, before the experiments of Haller on irritability, an account of which was published in 1752. From them he inferred, that the power not only of the heart, but of the muscles of voluntary motion also, resides in the muscle itself, and consequently is independent of the nervous system\*. But not content with

\* The experiments of Haller on this subject, are in one respect defective, which enabled his opponents to object to his inference. This defect is considered, and an attempt made to supply it, in the third chapter of the second part of the *Inquiry into the Laws of the Vital Functions* just mentioned. Experiments 34 and 35, and the observations in page 88, et seq.; see also Chap. X., third edition.

having arrived at this important fact, and finding from his experiments that while the muscles of voluntary motion were easily excited through their nerves, the heart could not be excited in the same way, he inferred that the latter was incapable of being directly influenced through the nervous system. This hasty inference, although very generally, was not universally admitted, and the followers of Haller and his opponents who, for more than half a century, have formed the two great classes of physiologists both in this country and the continent, have equally with Haller himself failed in explaining the mutual dependence of the sanguiferous and nervous systems.

One of the ablest of the latter class of writers, M. le Gallois, if he can be called an opponent of Haller, for he admits with him that the brain has no direct influence over the heart; being unable to answer the arguments of Haller on this head, yet convinced from a thousand phenomena that the heart was more or less directly subjected to the influence of the brain, had recourse to experiment; and arrived at a discovery of great consequence, namely, that the heart is capable of being directly influenced through the spinal marrow. This fact appeared to him to afford an easy solution of the question, it being acknowledged on all hands that the spinal marrow is under the immediate influence of the brain. It was only necessary, therefore, in order to explain the phenomena, to suppose that the brain affects the heart through this organ; and such was the state of public opinion on the subject, and even at this late period, so inaccurate our mode of reasoning respecting the animal economy, that this supposition, although it is evident from a careful review of his experiments that they do not correctly bear upon it, was generally admitted, and his labours were regarded as having removed all difficulties.

A little before I entered on the inquiry, the Institute of France, after the experiments of M. le Gallois had been repeated in the presence of a committee appointed by it for the purpose, consisting of the celebrated Humboldt, M. Hallé, and M. Percy, published a Memoir, drawn up by the committee in support of his conclusions, nearly as long as the work in which they were originally stated; and the medical journals both of this country and the continent admitted their accuracy.

From two papers which the Royal Society did me the honour to publish above seventeen years ago, it appears, that M. le Gallois had in several respects been deceived in his inferences; and that although the power not only of the heart, but of the blood-vessels also, is independent of the brain; this organ, far from acting on the former only through the spinal marrow, is capable of directly affecting both, and that even to the total destruction of their power.

These points, in consequence of the frequent repetition by others, of the experiments on which they are founded, have now been generally admitted. But the opinion of Haller, apparently founded on experiment, and sanctioned by the authority of a name so respected, had become almost general, and could not fail, and probably for a long time to come will not fail, essentially to influence our views of disease, and, consequently, our plans of treatment. It has led physicians too much to neglect the influence of the nervous system in their reasonings respecting the diseases of the circulation, and to ascribe to that system less than they ought to have done in almost all diseases, whether we regard their symptoms or the changes induced in their progress; and, consequently, except where the cause of derangement is evidently seated in the nervous system itself, to be too little influenced by its agency in their plans of cure.

As the old pathologists erred in ascribing every thing to the nervous, the moderns have equally erred in ascribing too much to the muscular, power; and facts of every day occurrence, which made too strong an impression on the former, have failed to have their due weight with the latter; for an unprepossessed mind might, by the phenomena of disease alone, have seen reason to suppose that not only is the function of every part under the influence of the nervous system, but that the healthy structure of every part depends on it; and, therefore, that through it, not only disease of function, but of structure itself, may arise from causes confined to distant parts, and with which at first view the seat of the disease seems to have no further connexion, than that they are parts of the same animal body.

It appears from a paper which I had the honour to present to the Royal Society in 1826, and which is published in the

Philosophical Transactions of the following year, that by injury of the functions of the nervous system, all the other vital powers remaining entire, except as far as they are affected by this injury, organic disease may be established in the lungs, even in the space of a few hours\*.

Thus the bias given to public opinion by the inferences of Haller has tended to counteract that which would naturally have arisen from the phenomena of disease itself, and would have led us to consider the sanguiferous as no less immediately under the control of the nervous, than the latter is under that of the sanguiferous system; and, hence, to perceive how much both the origin and progress of their morbid affections are influenced by this cause.

Some wonder has been expressed that tubercles of the lungs should be regarded as in any case arising from disease of the digestive organs, although we every day see them a consequence of this disease; and an attempt has been made to explain their presence, in the cases in which they supervene on protracted Indigestion, by some theory about their previous existence. If they previously exist in such cases, it must be while there is no symptom of disease, because in these cases the first symptoms are always those of failure of the digestive organs. The tubercles then exist without betraying themselves by any indication! Surely, even the author of this explanation must here perceive that it rests on no foundation, but the gratuitous assumption that nervous irritation cannot produce tubercles.

We have here an instance of only one of the respects in which the depreciation of the power of the nervous system has misled the physician; for the same power which can produce disease can *à fortiori* influence it after it has taken place; and the same channel, which can convey the cause of the disease, can also convey the influence of the means of cure.

A wish to impress more strongly than had been done, on the members of our profession, these truths, equally the result of the inquiries in which I had been engaged, and the phenomena of disease, formed, as I have stated in the preface to the

\* I have endeavoured to prosecute this subject farther. See the paper just referred to, also the Philosophical Transactions for 1822, and the third edition of my Inquiry into the Laws of the Vital Functions.

present edition, one of my strongest motives for publishing this Treatise, the symptoms of indigestion, from the extensive sympathies of the stomach, being peculiarly adapted to illustrate the laws in question.

The contractile power of every muscle exists in itself. There is no direct connexion between it and that of any other. There are no means, for example, of impairing or destroying the power of the heart which can through it directly affect that of the muscles of a limb; nor *vice versâ*. There is no common centre of muscular power. But the excitability of every part is formed into a whole by the nervous system, which is capable of directly impressing and receiving impressions from every part to which the functions of life belong; and has a common centre in the brain and spinal marrow, to which all the impressions it receives are conveyed, and where all the energies it exerts originate\*. Thus it is that every part of the system is, more or less, under the influence of every other. Can it then be supposed that the digestive organs, the central and most sensible part of the whole, can be affected without influencing all others, or that any important deviation from health can exist without influencing them? In a large proportion of our more serious diseases, an inquiry into the state of the digestive organs is as essential, as that into the state of the pulse; and often throws more light both on the nature of the disease and the means of relieving it; an observation fully illustrated in the remarks I have had occasion to make on the manner in which diseases of other parts, or of the whole system, influence and are influenced by the state of these organs,

With respect to the extended sense in which I use the term Indigestion; if by this term we mean both a failure in the function of digestion and its consequences, and how can the former be separated from the latter, there is no other sense in which it can be used. It has always in fact been used in this sense, but hitherto no one has been at the trouble to inquire how far the consequences of Indigestion extend. It is not that my use of the term is new, but that I have endeavoured to

\* I have within the last few weeks presented to the Royal Society a paper in which these positions are illustrated experimentally.

show that, in its usual acceptation, it includes more than has been referred to it. What other definition of a disease can be given, but that it is a train of symptoms (either existing at the same time or in succession) arising from the same cause?

Although, from the stomach being the great centre of the sympathies of our frame, and consequently the organ of most consequence in considering these sympathies, I have entitled the foregoing pages a *Treatise on Indigestion*, I offered it originally, and still more, in its present form, now offer it, to the members of our profession, as an attempt to point out and correct the errors which have gradually crept into the practice of medicine from the depreciation of the powers of the nervous system ; and those who take the trouble to peruse it with care, will perceive that its principles extend to certain and very common forms of all the diseases to which we are subject.

Compare the foregoing Appendix with the general conclusions in the two last paragraphs of the *Treatise*.

THE END.

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